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# AMERICAN BLACKSMITH<sup>2</sup>

BUFFALO  
N.Y. U.S.A.

A Practical Journal of Blacksmithing and Wagonmaking

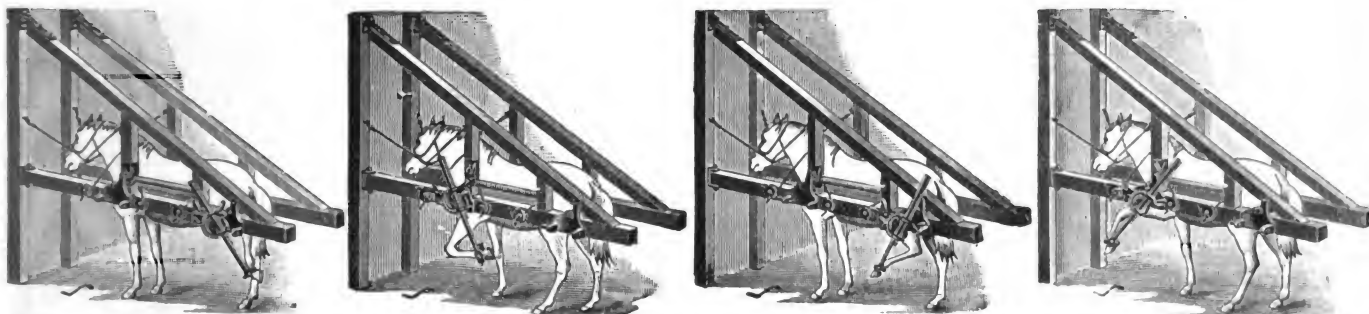
OCTOBER, 1905

\$1.00 A YEAR  
10¢ A COPY

## TO THE FRONT

Our announcement this month occupies the front cover—it is foremost among advertisements. In like manner our celebrated Barcus Stocks are foremost in their field. Competitors are far behind our lead. Nothing else on the market can take the place of genuine Barcus Stocks. They are guaranteed to hold any horse perfectly without danger to man or beast if properly handled according to our printed directions. The objectionable features of the cheap stock have been eliminated.

## BARCUS STOCKS



## BARCUS STOCKS

MR. GEO. BARCUS:

DEAR SIR—Before purchasing one of your stocks I wrote to a number of shoers about them, and they all advised me to buy one, and I must say that I have been well repaid. I have had horses come to me as far as 15 miles away, and this week I am going to have one come from Gloucester, and he has not had a shoe on his hind feet for four months. There isn't the least chance to get hurt, for your stock is so easy to operate that neither man nor horse can get hurt. The horseshoer will never know what it is until he has one in his shop.

J. F. RYAN.

BEAVER CROSSING, NEBR., Feb. 10, 1904.

MR. GEO. BARCUS:

Sir—I have used a set of your Horse Stocks since last November, and they have given me perfect satisfaction. I run one of the biggest shoeing shops in the County, and will say no man that shoes horses can afford to run a shop without one of those stocks, as they will bring a man enough more work in a year to pay for themselves, as every man will say after he has seen the machine used. He would rather have his horse put in it than have a severe twitch put on it. Will say you are at liberty to use this statement if it is of any use to you.

Yours respectfully,

J. H. MCCORD.

are not the cheapest, but they are the best. Hundreds of enthusiastic users have sent us their personal endorsement of these celebrated stocks.

### Note Low Freight Rate.

Our Catalogue is Free, send for it and other matter of extreme interest to the shoer.

Write for Particulars.

### The Barcus Toe Calk Machine.

Has a record of five toes per minute and this machine installed in your shop will save to you in cash at the rate of \$6 per day when in use.

Write for Particulars.



## Geo. Barcus & Co.

Box 61.

Wabash, Ind.

U. S. A.



**Special  
Prices to  
Carriage Makers  
and Blacksmiths  
if this paper  
is mentioned.**



Fig. 900, 12 inches.

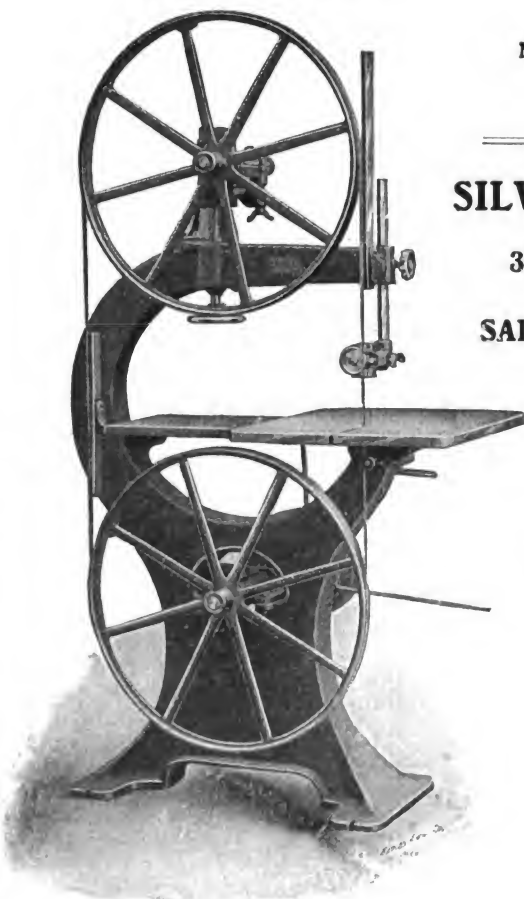


Fig. 822, 32 inch.

# Carriage Maker and Blacksmith Tools

**Fig. 900, "Elite," Silver Blower** (*patent applied for*) is distinctive in design, has cut gearing and removable, interchangeable bronze bearings for gear pinions. The gearing is self contained and attached to side of fan case, has an outer bearing plate over it and is thus permanently secured so that there is no unnecessary friction or lost power. The gear covering is removable without disturbing the gearing or paddle spider. There is a light tuyere for clay lining and a heavy one to use without lining. All parts are interchangeable.

**Fig. 822, Band Saws** are made in sizes 20 and 26 inch for foot or belt power and 32 and 36 inch for belt power. They are properly constructed, nicely finished, adapted to factory and repair work of every kind and give unusual satisfaction.

**Fig. 718, Spoke Tenon Machine** cuts tenons  $\frac{1}{8}$  to 2 inches diameter up to 6 inches long and also bores the felloe.

**Fig. 709, Taper Hub Boxing Machine** is made as illustrated, on legs and also without legs to mount on bench. It bores tapering holes in the hubs for the boxes and cuts the recesses for nuts and collars.

Made also for hand and power.

**Also Forges, and a complete line of Hand and Power Drills.**

Manufactured by

— THE —  
**SILVER MFG. CO.,**

365 Broadway,

SALEM, OHIO.

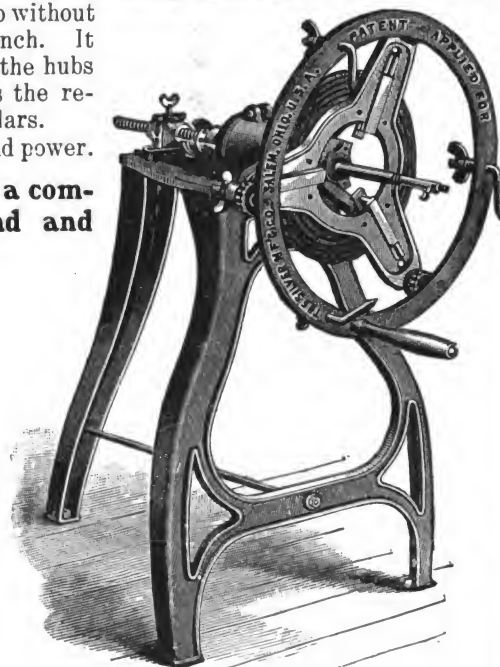


Fig. 709.

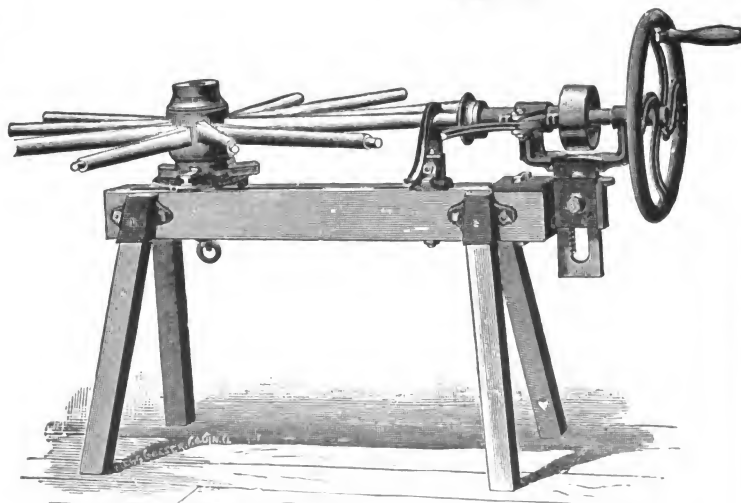
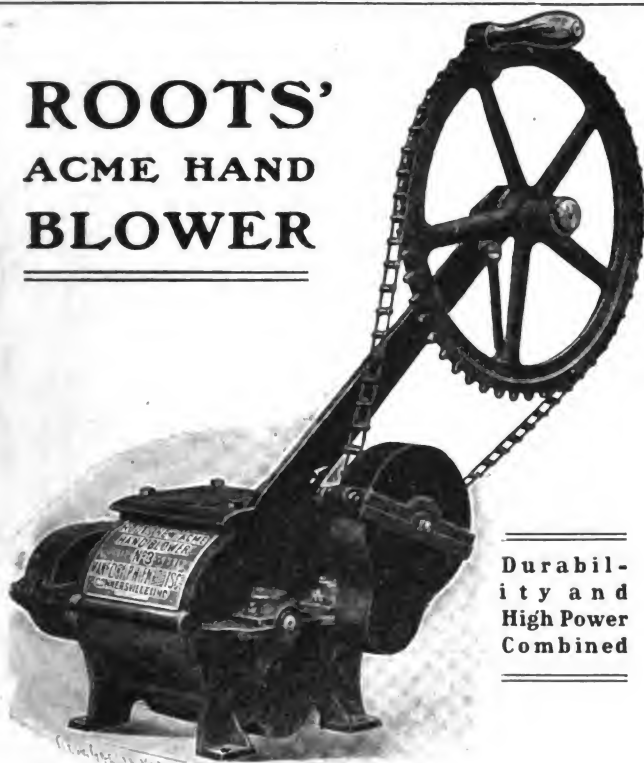


Fig. 718.

# 20 YEARS OF EXPERIENCE

## ROOTS' ACME HAND BLOWER



**Durabil-  
ity and  
High Power  
Combined**

Embodied in this superior blower, and experience counts in the manufacture of up-to-date shop machinery. Absolutely every weak point has been eliminated in this new machine. Equalled by no other blower on the market. Any smith can now renew the bearings in the new blower in a very few minutes.

**Has the  
Unqualified  
Indorsement  
of every  
Mechanic who  
has used it.**

ASK YOUR HARDWARE MERCHANT FOR

**ROOTS'**  
**Acme Hand Blower for Blacksmiths**  
**—\$15.50—**

NET PRICE WITH BOX AND CONNECTING PIPE FOR TUYERE.

**P. H. & F. M. ROOTS CO.**

NEW YORK OFFICE:  
120-122 Liberty Street.

Connersville, Ind.

CHICAGO OFFICE:  
1547 Marquette Building.



PLATE PATTERN.



# CAPEWELL HORSE NAILS

ARE THE BEST IN THE WORLD

Drive the Best, Hold the Best, Safest to Use,  
Most Perfect in Form and Finish

The following voluntary testimonial is from Matt Byrnes, trainer of "Salvator" when he won the Suburban and broke the time record for a mile. He has trained other Suburban winners and some of the best known horses in the country.

PLAIN PATTERN REGULAR HEAD.

BELMONT PARK, L. I., N. Y., August 11, 1905.  
THE CAPEWELL HORSE NAIL CO.,  
Hartford, Conn.

Gentlemen:—

Capewell Horse shoe nails are the best in use,—in a class by themselves.

Yours truly,

MATT BYRNES.

PLAIN PATTERN CITY HEAD.

Made by **The Capewell Horse Nail Company**  
**HARTFORD, CONN.**

The Largest Manufacturers of Horse Shoe Nails in the World

## BRANCHES

New York: 103 Beekman St.  
Philadelphia: 323 Arch St.  
Baltimore: 326 North Gay St.  
Buffalo: 11 Ellicott St.  
Cincinnati: 720 Main St.  
Detroit: 29-31 Farrar St.  
Mexico City: Apartado, 2377.

Chicago: 238-240 Randolph St.  
St. Louis: 12-14 North 12th St.  
New Orleans: 736 Union St.  
Denver: 1520 20th St.  
San Francisco: 636 Mission St.  
Portland: 554 Worcester Block.  
Toronto, Can.: 54 Duke St.

**1905 Calendar and Complete Catalogue Free on Application.**

CORRUGATED PATTERN.



ALL OVER THE WORLD!

# The 1902 CHICAGO CLIPPER

Price, \$10.75

"Stewart's Patent" is recognized as the Greatest Clipping Machine ever invented.

More of them are sold every day ten times over than all other makes combined. Each one is sold under a positive guarantee to clip faster and turn easier than any other machine made, regardless of price, or money refunded. All gearing is cut from solid metal, and unlike any other machine made, it can be turned with either the right or left hand.

## IT'S EASY MONEY

blacksmiths make using this clipper. Horse clipping is now a part of every up-to-date horse shoeing establishment. Why, look at the profit. You can clip a horse in 30 minutes with this machine, and every horse owner recognizes the advantages of clipping.

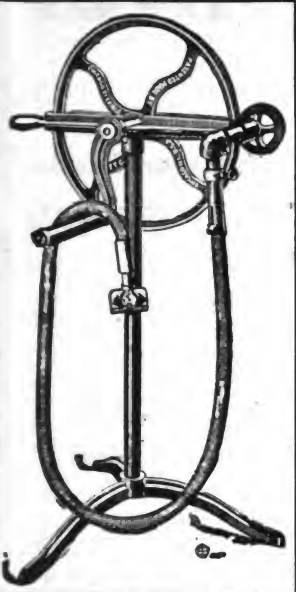
Send \$3.00 and machine will be sent C. O. D. for the balance.

Catalog on request.

Yours very truly,

## Chicago Flexible Shaft Co.

186 Ontario Street, CHICAGO.



OF COURSE this is an impossible picture, but it will serve to call attention to the West Tire Setter, a tire setting machine that does all the work of setting a tire better than it can be done any other way, and in one minute, as against an hour by the old way. Every manufacturer of vehicles or wheels and every repair man and blacksmith should have one. Saves its cost and shows a handsome profit in a very short time.

WRITE FOR CATALOG.

## The West Tire Setter Co.

Rochester, N.Y.



A  
Cant Slip

A—As shown in illustration. The original Cant Slip Calk has so thoroughly demonstrated its superior merit that it requires neither introduction or recommendation.

C—Is specially designed for use on snow and ice covered roads, and on account of its form and penetrating properties has proven a complete success.



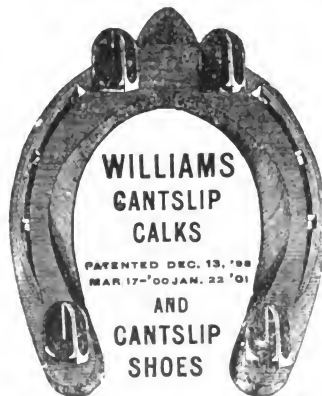
C  
Solid Steel

TO THE BLACKSMITH: We offer you for the coming season a line of Calks that are in advance of anything offered by any manufacturer. When you have had the opportunity of seeing Calks in actual use, you will bear us out in this assertion.

## BITTENBENDER & CO.

Sole Distributors for the United States.  
WRITE YOUR DEALER FOR PRICES.

Scranton, Penna.



SOLD ONLY TO THE BLACKSMITH.



B  
Steel Center

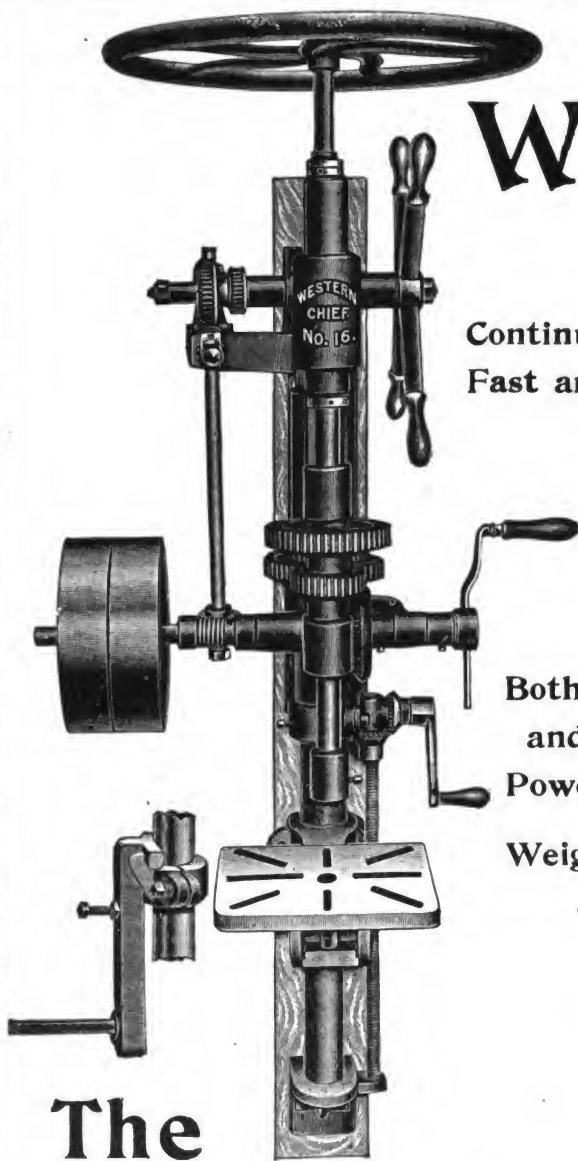
B—A new production. Has a hard steel center extending through the entire length of calk, which is perfectly round and true to the center. Is encased with softer metal which will insure a perfect uniformity of shape and will continue to wear sharper with use.

D—Or mud calk, for use where sharp calks are not required and will give excellent service.



D  
Mud





# No. 16 Western Chief DRILL

Continuous Screw Feed.

Hand Lever Feed.

Fast and Slow Speed.

All Gears are Cut.

Raise and Lower to Table.

Drills to center of 24-inch circle.

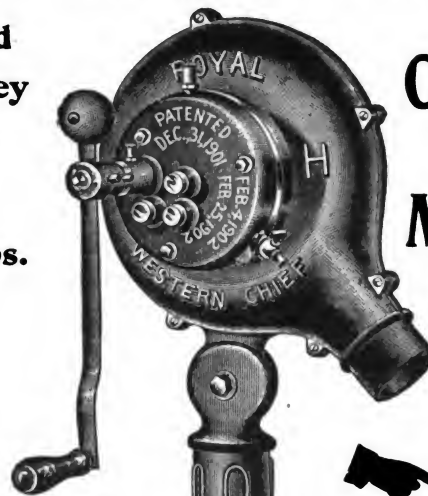
Bores 0 to 1½ in.

Spindle runs up and down 8½ inches.

Table runs up and down 16½ inches.

Both Hand  
and Pulley  
Power.

Weighs  
360 lbs.



MADE BY  
**CANEDY-  
OTTO  
MFG.CO.**

CHICAGO  
HEIGHTS  
ILL.

## The Royal Blower

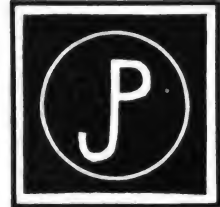
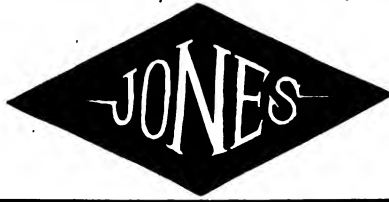
is absolutely free from all spiral or worm gears, and has not a ball bearing in it. Spiral and worm gears are short lived, and ball bearings are not suited to such high speeds. Phosphor bronze is used for the lead gear and bearings; and steel for the pinions and shafts. It is the simplest, lightest running and surest worker of any Blower on this day's market.

FAN, 12 inches diameter.  
FIRE POT, 9x11½ x4, inside.



Royal and  
Western Chief  
Forges, Blowers  
and Drills are  
sold by every  
First-class Dealer  
in the World.

**Ask For  
Them.**



**THE NAME JONES** on a wheel means the same as the word "Sterling"  
on silverware:

**THE STANDARD OF PERFECTION**

If you have never used

**JONES STANDARD WHEELS**

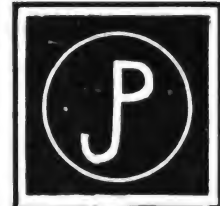
you have never had

**THE BEST**

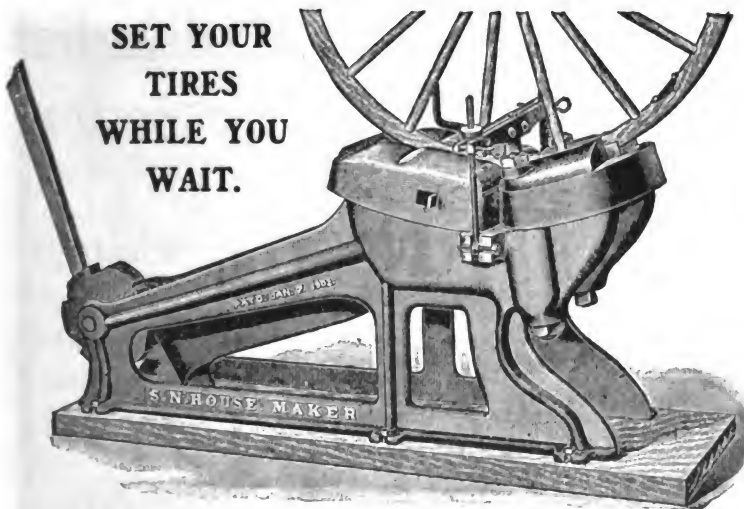


**Jones Wheels Best on Earth**

Newark, New Jersey



SET YOUR  
TIRES  
WHILE YOU  
WAIT.



### THE HOUSE COLD TIRE SETTER

Nearly 2,000 in successful use and all of them placed in the last three years. This demonstrates the fact that a **Successful Cold Tire Setter** has been made after twenty years' hard work and after fifteen patents have been issued to other inventors which we must admit have comparatively all failed; but don't let that discourage you. The first locomotive, sewing-machine, and harvester were failures, but are a success now and so is our machine. It is simple and works on the principle of the hot tire shrinker, and it can't be broken, and you can't make a mistake in buying it. Write us for catalogue and prices.

This cut shows that when the keys grip the tire in each head, and the heads are brought together, that they move with the circle of the wheel, and pull the tire from both ways round the wheel, tightening it nicely, and cannot kink the tire nor injure the felloe; but simply shrink the tire cold in a short space between the two heads just as the hot shrinker has always done.



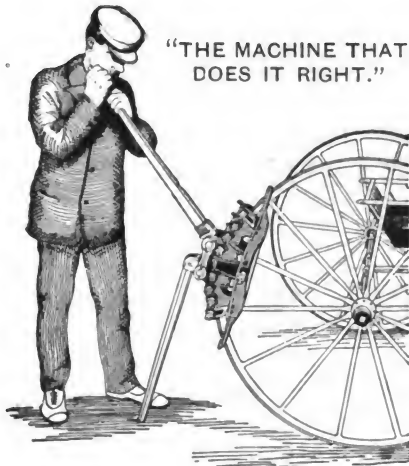
The above facts show our machine has proven heretofore to be a wonderful success, but we never sleep, and are now offering our new, wonderfully improved machine, which is the third improvement patented by us in the three years. This last improvement doubles its value to the blacksmith. There never was anything offered to the trade that possesses any such value. Write us for catalogue and prices.

**THE HOUSE COLD TIRE SETTER CO.**

Office and Factory, 216 to 220 South Third St.,

ST. LOUIS, MO.

# SCHAU TIRE SETTER



"THE MACHINE THAT  
DOES IT RIGHT."

3,000  
in use  
in the  
United  
States  
and  
Canada

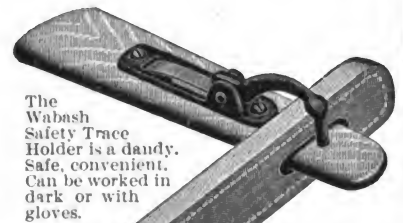
Write for Catalogue.

## BURTT MFG. CO.

Kalamazoo, Mich.

# An Attractive Offer

is here made to get you acquainted with our rapid selling specialties. Blacksmiths and wagon men all over the country are making nice profit by selling our goods, with no trouble at all. Only a few specialties are shown here.



The Wabash Safety Trace Holder is a dandy. Safe, convenient. Can be worked in dark or with gloves.

Harsh's Dash Line Holder is a convenience every vehicle owner appreciates.



I·X·L

For 50 Cts.

We will send you postpaid

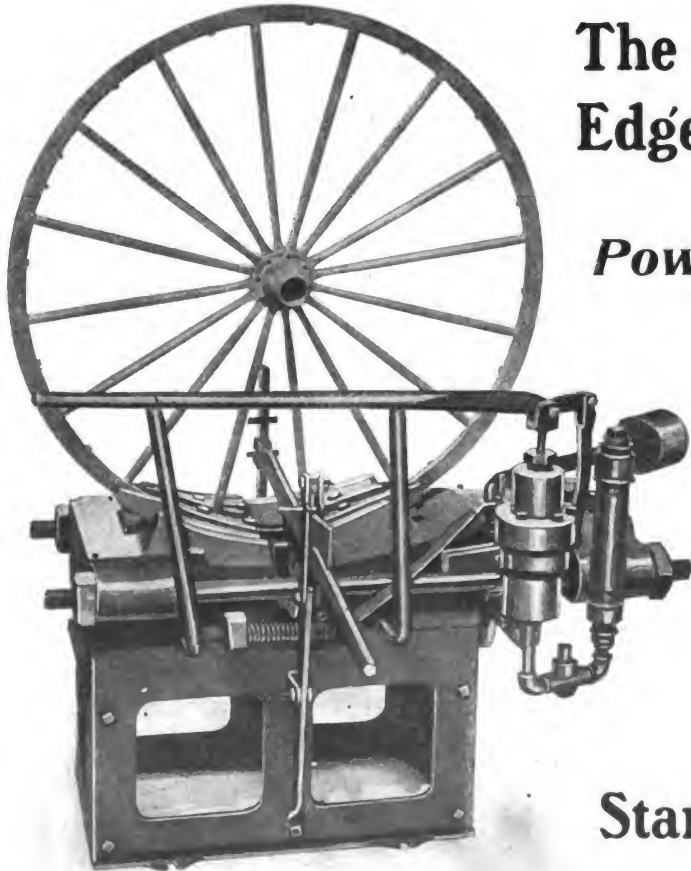
1 pair IXL Anti-Rattlers,  
1 pair Safety Trace Holders,  
1 Dash Line Holder.

Our IXL Anti-Rattlers are easily put in and are guaranteed to stop rattle of pole or shaft.

For \$1.25, we will send postpaid a dozen pair of single safety trace holders, or For \$1.50, one dozen pair of double safety trace holders. **WRITE TODAY.**

Write for our Circulars and Price List.

**Lauder, Harter & Harsh Mfg. Company**  
20-30 So. Miami St., Wabash, Ind.



# The Scientific, Hydraulic Edge Grip Cold Tire Setter

Sets tires cold by a few strokes of a

## Powerful Hydraulic Pump

### The Warranty Tells the Tale

It is warranted to work as well in every respect, or better, than any other edge grip tire setter, and in addition is warranted to work much

### EASIER AND QUICKER

These are two most valuable points in a hand power cold tire setter.

Its gripping jaws grip the tires accurately and let go quickly without the use of a hammer.

For full information, address,

**Standard Tire Setter Co.**  
KEOKUK, IOWA

**RUBBER RUNABOUT, \$35.00**  
**TIED TOP BUGGY, \$27.50**  
**BUGGY TOPS, \$4.50**  
 Write for 100-page Catalogue. It's free. Compare Our Prices.  
**BUOB & SCHEU, Estab 500-520 EAST COURT ST. 1883 CINCINNATI, OHIO.**

**SEND FOR BAUER'S RED BOOK**  
 and Price List on

**Tops and Trimmings**  
**Tops, \$4.50 and up.**

**BAUER BROS. MFG. CO.**

**937-939-941 W. 8th St.**  
**CINCINNATI, O.**



**PATENTS** **PROTECT YOUR IDEAS**

No Patent, No Fee. Consultation Free.  
 Established 1864.

**MILO B. STEVENS & CO.,**  
 852 14th St., Washington.



**THE BLACKSMITH'S FRIEND**

With the aid of this tire setter any one man can set tires of any kind satisfactorily. Strongly built, easy to operate, a new, practical device for up-to-date shops. Write for prices.

**GEO. W. TINKEY, PLYMOUTH, O.**



**Lathes and Drill Presses**

Especially for Blacksmiths and Machinists, also Hand and Power Planers and Shapers and Machinists' Supplies.

Catalogue M.

**SHEPARD LATHE CO., 132 W. 2d St., Cincinnati, O.**

**High Pressure Brand No. 2 Brazing Forge**



Patented February 7, 1900.

Will do all kinds of brazing, both light and heavy. It is fitted with three powerful improved Hydro Carbon Burners. Both Gasoline and Kerosene Machines in stock. Write for description.

**The National Cement and Rubber Mfg. Co.,**  
**3051 Monroe Street. TOLEDO, OHIO. U. S. A.**

**PORTER'S**

**THE BEST**

**BOLT CLIPPERS**

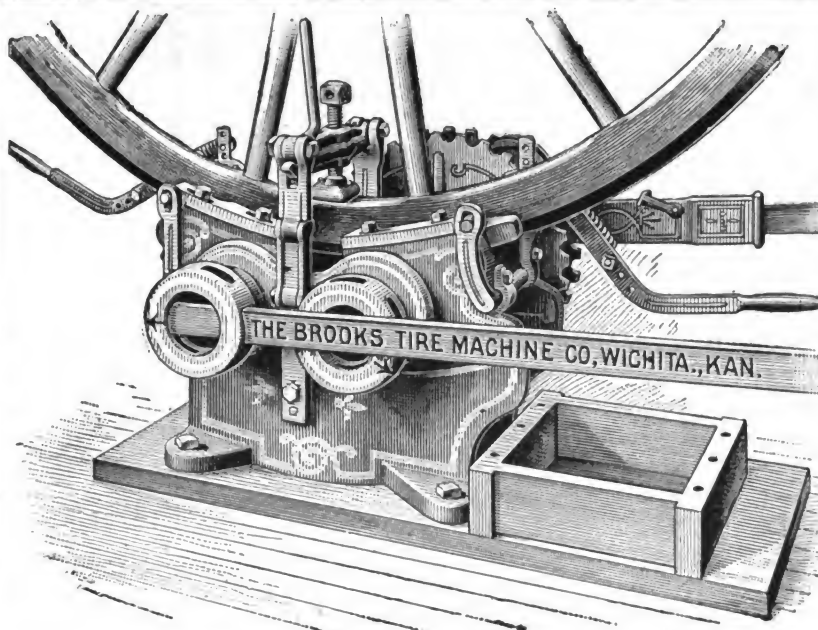
**H. K. PORTER, Sole Manufacturer**  
**EVERETT, MASS.**



"Easy" for 3-8 and 1-2-inch Bolts

This Cut Shows No. 2  
**NEW EASY** for 1-2-inch Bolts  
 My Latest Tool.

"New Easy" for 5-16, 3-8, 1-2 and 5-8-inch Bolts



## THE BROOKS COLD TIRE SETTER

A machine for upsetting tires cold while on the wheels. It gives just the amount of dish or tension to the wheel required without checking or splitting the felloe at the spoke tenons. It eliminates all chances of injuring the wheels. It is unnecessary to remove the tire or bolts from the wheel to upset the tire. It does accurate and rapid work. It is durable and simple in construction.

The BROOKS' reputation was long established and a big demand created for it before any other edge grip machine now on the market was built. The necessary construction of

### A Successful Edge Grip Machine

is protected by our patents which other builders cannot use without infringing. The great success of the BROOKS has caused the United States Government to adopt cold tire setting, and the BROOKS is the only edge grip machine used in the Government shops. Why? Because on thorough investigation the Government departments found it to be the best. It is manufactured by the longest established and most experienced builders of edge grip cold tire setters in the United States. Think it over and write us. **DO IT NOW.** We want to send you our printed matter.

**THE BROOKS TIRE MACHINE CO.**

**121 N. Water Street, Wichita, Kan., U. S. A.**

**HAND  
FORGED**



**BUTCHER  
KNIVES**

**A GOOD  
SIDE-LINE**

Hundreds of blacksmiths are making large profits by selling these blades. Each one is fully warranted. Made of Sanderson Steel.

**\$ .15 EACH**  
**\$ 1.50 DOZ.**

Round or riveted. All sizes from 5 to 8 inch.

Handles ready to put on, 1c each.

Hand Forged Razors, ready to use, 40 cents each.

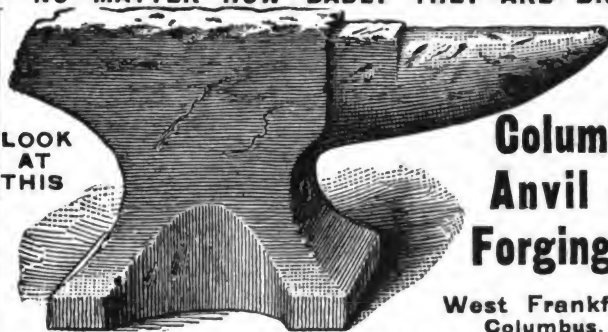
Pocket Knife Handles in variety, 10 cents each. Send for sample.

**WOODWORTH KNIFE WORKS, NUNDA, NEW YORK**



NO MATTER HOW BADLY THEY ARE BROKEN WE CAN REPAIR THEM IN GOOD SHAPE.

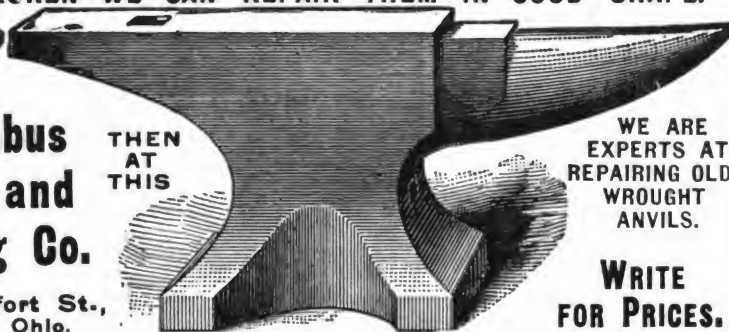
LOOK  
AT  
THIS



**Columbus  
Anvil and  
Forging Co.**

West Frankfort St.,  
Columbus, Ohio.

THEN  
AT  
THIS



WE ARE  
EXPERTS AT  
REPAIRING OLD  
WROUGHT  
ANVILS.

WRITE  
FOR PRICES.

WE ALSO MANUFACTURE THE CELEBRATED ARM AND HAMMER BRAND ANVIL.

ASK YOUR DEALER FOR THEM.

## HONEST DEALINGS

Before an advertisement is accepted for this journal, careful inquiry is made concerning the standing of the house signing it. Our readers are our friends and their interest will be protected. As a constant example of our good faith in AMERICAN BLACKSMITH advertisers, we will make good to subscribers loss sustained from any who prove to be deliberate swindlers. We must be notified within a month of the transaction giving rise to complaint. This does not mean that we will concern ourselves with the settlement of petty misunderstandings between subscribers and advertisers, nor will we be responsible for losses of honorable bankrupts.

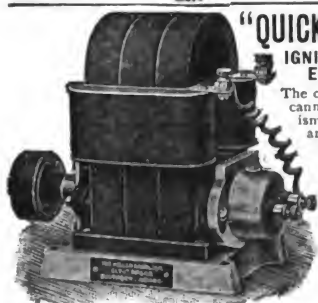
VICTORIA  
BOWS,  
OVAL TOP  
EXPRESS,  
FLAT TOP  
EXPRESS,  
BUGGY BOWS

Some of the Bows we make. Write for catalogue describing our full line.



**S. N.  
BROWN & CO.**

DAYTON, O.



**"QUICK ACTION"**  
IGNITING DYNAMOS  
Excel All Others!

The only generator that cannot lose its magnetism. For either make and break, or jump spark work. Also spark coils. Send for Catalogue B.

The  
**Knoblock-  
Heideman  
Mfg. Co.,**  
SOUTH BEND,  
IND.

## Locations for Industries

*Erie Railroad System  
New York to Chicago*

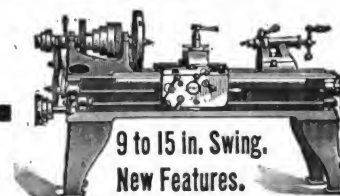
The Erie Railroad System's Industrial Department has all the territory traversed by the railroad districted in relation to resources; markets and advantages for manufacturing, and can advise with manufacturers of specific products as to suitable locations, furnishing them with current information of a comprehensive nature, dealing with the project in its full relation to manufacture and commerce.

Address

**LUIS JACKSON**

Industrial Commissioner, Erie Railroad Company

21 Cortlandt Street, New York



9 to 15 in. Swing.  
New Features.

SEBASTIAN LATHES are Good Lathes  
Catalogue Free. Sizes 9, 10, 13, 15 inches.

Our engine lathes are provided with both screw and rod feeds as well as power cross feed. Gears to cut all standard threads from 5 to 36 are furnished. Steady and tool-rests, large and small face plates and countershaft go with each Lathe. Foot Lathes, Tools and Supplies.

SEBASTIAN LATHE CO.  
124-126 Culvert Street, CINCINNATI, OHIO.



**The Ideal Steel Toe Calk**

Write for Circular and Prices.

**THE WEYBURN COMPANY**  
Rockford, Illinois.

Style No. 1,  
Cyclone  
Portable  
Forge.



Our Free Catalogue illustrates more than 20 other styles

Easy  
Running.  
Powerful.  
Large  
Capacity.

## CYCLONE PORTABLE FORGE

The Cyclone Portable Forge, shown here, is a favorite everywhere. Suitable for heavy, as well as light work. Has a 28x40 in. hearth, large capacity coal box and a 14 in. fan. The deep firebox and powerful blast make the Cyclone Style No. 1 capable of doing the heaviest kind of work. The Cyclone has double Ratchet, Adjustable Legs, Solid Frame, Detachable Lever hung on Ball Joint and swinging in chilled seat. FULLY GUARANTEED.

Write today for our FREE Catalogue and SPECIAL INTRODUCTORY PRICES.

**FOOS MANUFACTURING CO.,**  
28 Sheridan Ave. SPRINGFIELD, OHIO.

## "Union" Combination Self-Feed Rip and Cross-Cut Saw

(Almost a complete workshop in one machine.)

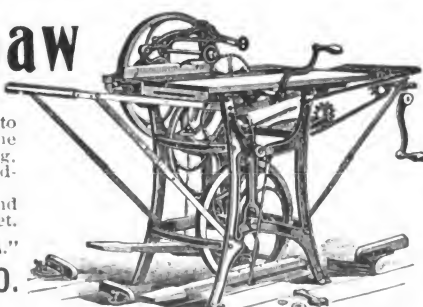
is suitable for various kinds of work:—ripping (up to 3 1/2" thick), cross-cutting, mitring, etc., and with the addition of extra attachments, rabbeting, grooving, gaining, dadoing, boring, scroll-sawing, edge-moulding, beading, etc.

The heaviest, most substantial, accurate and easiest running machine of its kind on the market.

Machines Sent on Trial. Send for Catalog "A."

**THE SENECA FALLS MFG. CO.**

274 Water Street, Seneca Falls, N. Y.



(87)

## TOOLS

FOR THE  
**HORSESHOER**  
AND  
**BLACKSMITH**  
IS OUR SPECIALTY



New Rounding Hammer.

FREE—a catalogue and hanger giving a table which will enable you to cut horseshoe moulds to any weight without waste.

**Champion Tool Co.**

Meadville, Pa.

THE JOSEPH F. MCCOY COMPANY, 157 Chambers St., New York City. Eastern Selling Agents.

# INCREASE YOUR EARNINGS

## BRAZING CAST IRON

An opportunity for progressive blacksmiths to make money easily.

## LITTLE CAPITAL REQUIRED

We have discovered the method by which cast-iron can be brazed successfully in a few minutes, and are establishing a good mechanic in each section of the country to represent us. Everyone knows that many articles of value, made of cast iron are being broken daily. They are discarded as worthless and must be replaced by new ones.

This means a loss of much money as the expense of replacing these broken castings is great. In many instances parts of machines are broken, and the machine lies idle waiting for repairs, much time being lost by the delay.

You can prevent these losses by mending broken castings with our compound "**BRAZIT**," and make a big profit on the work. You save the expense of a new casting, and in the case of repairing a broken part of a machine, the expensive delay of having the machine lie idle waiting for the new part.

You can mend broken parts of machines, gears, agricultural implements, pulleys, engines, stoves, automobile parts, sewing machines, lawn mowers, tools, and anything made of cast iron.



### A Few of the Many Letters from Satisfied Customers.

SHARON, S. C.  
I received the trial set of "Brazit" and can say it beats anything I ever saw. It does just as claimed. I put together a broken piece of cast iron and it was stronger than before it was broken.  
C. P. LOWRENCE.

NEW BEDFORD, MASS.  
I have mended a number of pieces of cast iron machinery with "Brazit" which have been very satisfactory, saving time and expense, and enabling me to repair pieces which would be very hard to duplicate.  
WILLARD N. LANE.

WESTFIELD, MASS.  
We acknowledge the receipt of your sample of "Brazit," which we have tried and found satisfactory.  
POPE MANUFACTURING CO.

SOUTH DARTMOUTH, MASS.  
I have used your compound and it worked O. K. Wish I had had some of it before.  
THEODORE BRIGHTMAN.

Will successfully braze cast iron, cast iron to wrought iron, and steel to cast iron, and all the joints will be as strong as before they were broken.

A special equipment is not necessary for this work as it is all done in your forge or with a brazing torch.

Hundreds of blacksmiths are using "**BRAZIT**" regularly, and find it to be a profitable side line. We want you to take up the work in your section. It means money in your pocket. You invest practically nothing, and the profits are large. In order to get you started, we have put up a sample working set, which is complete in every detail. With this set you can braze a number of pieces.

**We send this set for \$1.00, prepaid to any part of the world. Fill in the attached coupon and send with \$1.00 today. You can't afford to overlook this chance to INCREASE YOUR EARNINGS.**

OUR REGULAR WORKING SET, a Complete Outfit, with full plain directions, will be sent to any address for **\$5.00**

## U. S. BRAZING COMPOUND CO.

(INCORPORATED)

**113-115 South Second Street,  
NEW BEDFORD, MASS.**

A. B.  
OCT. '05,

U. S.  
Brazing Compound Co.  
New Bedford,  
Mass.

GENTLEMEN—Send me sample set of BRAZIT for which I enclose One Dollar.

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ADDRESS .....

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**A Text Book on Horseshoeing**, by A. Lungwitz. A complete treatise on anatomy, shoeing, bad feet, interfering, etc. Cloth bound, 168 pages, 141 illustrations..... **\$2.00**  
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**Practical Carriage and Wagon Painting**—A new enlarged edition of a standard book by M. C. Hilliek, **\$1.00** price, postpaid.....

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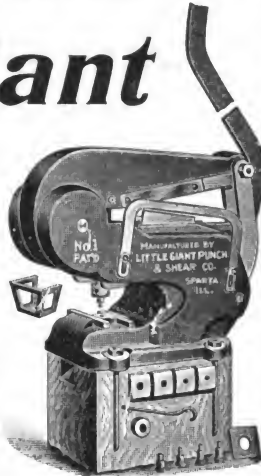
**Combined Punch and Shear.**

**The Most Powerful Lever Punch and Shear Made.**

This is not a new machine—only a new cut showing the improvements we have lately added—making it more valuable for the blacksmith. It is made in three sizes. No. 1 will punch  $\frac{3}{8}$  in. hole in  $\frac{1}{2}$  in. iron; cuts iron  $\frac{3}{8}$  in. thick and 1 inch round. Weight, 500 lbs. No. 2 will punch  $\frac{1}{2}$  in. hole in  $\frac{3}{4}$  in. iron, cuts iron  $\frac{1}{2}$  in. thick and  $\frac{3}{4}$  in. round. Weight, 350 lbs. No. 3 will punch  $\frac{3}{4}$  in. hole in  $\frac{3}{4}$  in. iron, cuts iron  $\frac{3}{4}$  in. thick and  $\frac{3}{4}$  in. round. Weight, 275 lbs. Each machine is equipped with **five** sets of punches and dies. This machine is made for the blacksmith shop and we **DO** claim that it is decidedly the best on the market for that place, and can furnish any amount of testimonials to that effect.

For Sale by your Jobber. If Not, Write Us. Send for Circular.

LITTLE GIANT PUNCH & SHEAR CO., Sparta, Ill.



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Would you be interested in learning how to pick up a good many extra dollars in your business with very little extra work? Would you like to increase your business—make it bigger—make more money and make more satisfied customers? You can do it and do it easily with

## O. K. Hoof Remedy

Hundreds of blacksmiths are doing it today and so can you. We want you to sell and recommend O. K. Hoof Remedy to your trade, and this is how we suggest you do it: First, we want you to test it. We want you to **KNOW** from actual experience what it will do so that you will have confidence in it—so that you will be enthusiastic over its merit. We will stand the risk if it does not do what we claim for it. For example, we offer \$100.00 for any case of Contracted Feet, Corns, Dry, Cracked, Brittle Hoofs, Scratches, Sores, Thrush and Quarter Cracks it fails to cure except in fonder when used as directed. We do more—we say to you, and you can say to your customers, back goes your money if it fails. You take no risk. Send for a trial can and get our special liberal terms to blacksmiths. We want you to handle this remedy in your locality. You can sell lots of it and make money. Send today and "clinch" the agency.

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 Room 450 Monon Building  
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**O.K. HOOF REMEDY  
 KEEPS HOOFS O.K.**



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TOP VIEW OF  
 BOLT-HEADING DIES  
 OUT OF  
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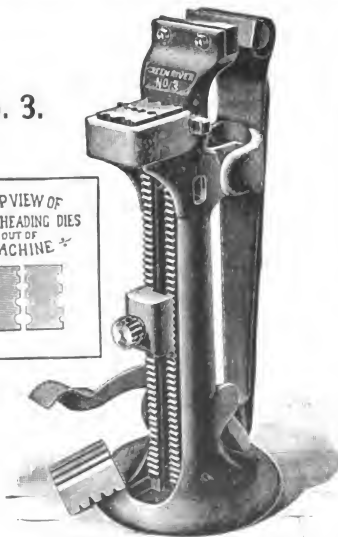
## GREEN RIVER SHOEING VISE

—AND—

## BOLT HEADER

No. 3.

TOP VIEW OF  
 BOLT-HEADING DIES  
 OUT OF  
 MACHINE \*



No. 3.

TOP VIEW OF  
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**Strong  
 Convenient  
 Reliable**

Blacksmiths considering buying a vise this season should write for catalogue and prices immediately.

MADE BY

**WILEY & RUSSELL  
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# COAL

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OLD COLONY BLDG., CHICAGO, ILL.

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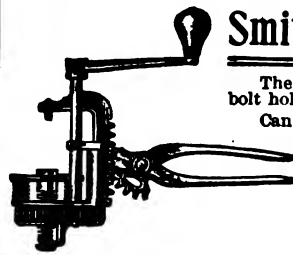
### L AFFITTE WELDING ? PLATES !

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**SEND \$1.00** for three heavy and three light plates as a trial order. All charges prepaid.

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The latest and best on the market. Has positive bolt holder and always in line. Can be used on poles and shafts.

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Sole Manufacturers

JANESVILLE, WIS.

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**SELL BLACKSMITHS' WAGON AND CAR-  
RIAGE MAKERS' TOOLS AND SUPPLIES  
CHEAPER THAN ANY OTHER HOUSE  
IN THE UNITED STATES.**    ♪   ♪   ♪   ♪

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## WATCH FOR OUR FULL PAGE AD IN NOVEMBER





## New Buffalo Portable Down Draft Forges, Patented 1905.

Here is an invention the value of which every blacksmith will see at once.

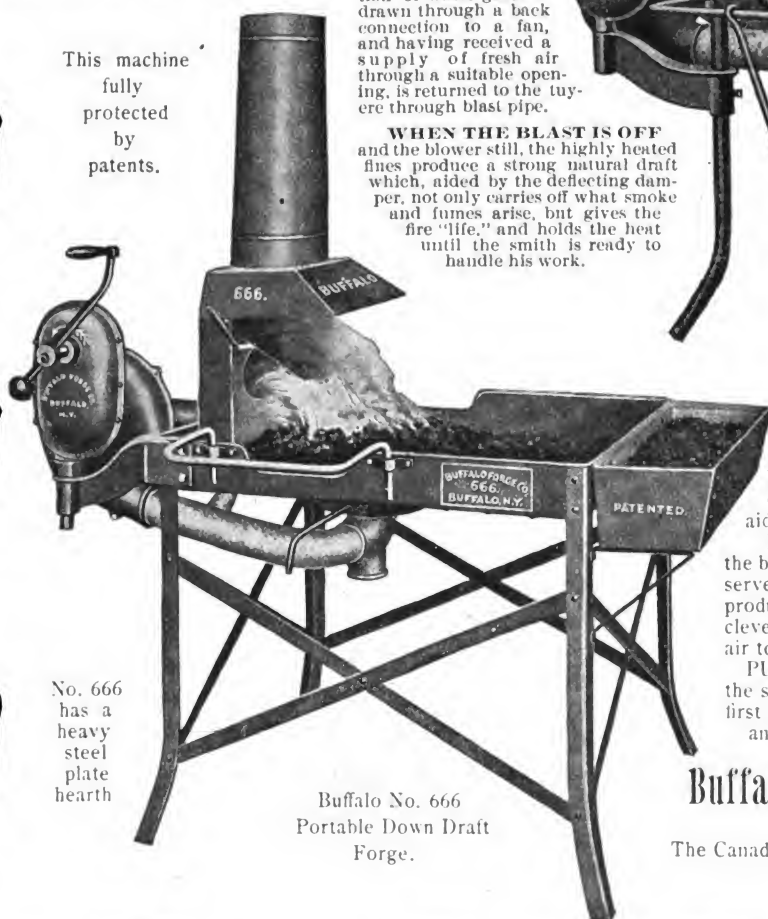
**A PORTABLE DOWN DRAFT FORGE.**—A most ingenious application of the down draft principle keeps the shop clean and clear. No smoke. No gases. No dust. No soot.

**HOW IT WORKS.**—In starting up, the clouds of smoke which pour into the smithy for some minutes before the chimney begins to "draw" with the ordinary forge are entirely avoided. A special connection provided with a damper leads from blast pipe through hood and well past double flue into stack. By this clever but simple device, a strong draft is created up the chimney the moment the blower is turned, without waiting until the chimney is heated.

**WHEN THE BLAST IS ON** and the fire throwing off the densest smoke, the down draft action is at its height, the fan drawing every vestige of smoke, sparks, etc., into the hood at the base of the stack whence the greater part escapes up the chimney. The remaining portion of waste gases is drawn through a back connection to a fan, and having received a supply of fresh air through a suitable opening, is returned to the tuyere through blast pipe.

**WHEN THE BLAST IS OFF** and the blower still, the highly heated fines produce a strong natural draft which, aided by the deflecting damper, not only carries off what smoke and fumes arise, but gives the fire "life," and holds the heat until the smith is ready to handle his work.

This machine fully protected by patents.



No. 666 has a heavy steel plate hearth

Buffalo No. 666  
Portable Down Draft  
Forge.

## Highest Award and Gold Medal

At World's Fair, St. Louis, 1905.  
Pan-American, Buffalo, 1901.  
Omaha, 1898.

The daily verdict of blacksmiths everywhere confirms these awards.



Buffalo  
No. 660 Portable  
Down Draft  
Forge  
with cast iron  
hearth.

COMBINED NATURAL AND MECHANICAL DRAFT is the working principle of the No. 660 and 666. The full existing natural draft is made use of aided by the exhausting strength of the No. 203 blower. NO ADDITIONAL POWER is necessary to operate the blower. In place of taking air at the fan case where it serves no useful purpose, it takes air from over the fire, producing a strong natural draft without extra effort. A clever device in exhaust connection admits sufficient cool air to prevent hot gases injuring blower.

PUT IN A BUFFALO No. 660 or 666 forge and keep the smithy cool, clean and light. It will pay you to be the first smith in your county to buy one of them. There is an offer worth while. Write for it.

**Buffalo Forge Company, Buffalo, N. Y.**

Canadian friends; save duty, buy of  
The Canadian Buffalo Forge Company, Ltd., Montreal, Quebec.



## Buffalo No. 200 Blower

*Built on Modern Mechanical Principles.*

THESE ARE CUT SPUR OR HELICAL GEARS, with broad heavy teeth. They are not spiral gears which cause friction and soon wear out. They are not spiral gears which get out of alignment, the objectionable feature of all spiral-gear blowers. (Ask your brother smith what he has already paid for repairs and will have to pay within five years.) Any part of a Buffalo No. 200 Blower wearing out in five years will be replaced free of all charge. Note the large proportion of these gears. They are mounted on a heavy cast iron frame, entirely independent of case. They are in a straight line and must run true. Frame prevents any possibility of their getting out of alignment, as the entire mechanism is self-contained. Remove the gear case and the gears run the same as before. The case serves merely to keep out the dust and furnish oil bath. These gears are as accurately cut as those on the finest machine tools. There are no brass boxes to wear out. The cold rolled polished steel shafts run in extra long bearings bored and reamed in a solid casting. The gears run in an oil bath, insuring perfect lubrication for months, without attention. An air-tight, dust-proof case protects the gears and keeps out all dust and grit. This is the only blower where the casing is adjustable for any desired angle of discharge of blast. An air meter or anemometer test shows that this blower delivers more air with less power than any other blower in the world.

**SPECIAL OFFER**—If you mention "The American Blacksmith" and are the first in your county to order one of these blowers, we will send free your choice of a No.

1 Tire Upsetter or a No. H H Tuyere. Both described on this page.

Offered free to first buyer in each county with No. 200 Buffalo Blower provided you mention the AMERICAN BLACKSMITH

Armor plate frame, unbreakable, light, strong. Upsets bands and tires  $1\frac{1}{8} \times \frac{1}{4}$  in. Fastens to post. We make several other sizes and styles.

"The  
Pride of  
The  
Modern  
Smithy."

Buffalo No. H. H. Improved Side and Center Blast Tuyere. Three blasts—right, left and center. Complete control of fire. Will not burn out. No clay lining. Offered free with No. 200 Hand Blower to first purchaser in each county, provided he mentions THE AMERICAN BLACKSMITH.

BUFFALO FORGE CO.

BUFFALO, N. Y.

BUFFALO FORGE CO.



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Fires your gas or gasoline engine without the aid of batteries.

It is better and more durable than any Dynamo. Its Governor regulates the speed regardless of speed of Fly Wheel. Its Governor adjusts to imperfect Fly Wheels. Its Governor insures a constant and uniform spark. The spark does not burn the contacts of the engine. All strains are removed from the bearings of Magneto. FULLY GUARANTEED. AGENTS WANTED.

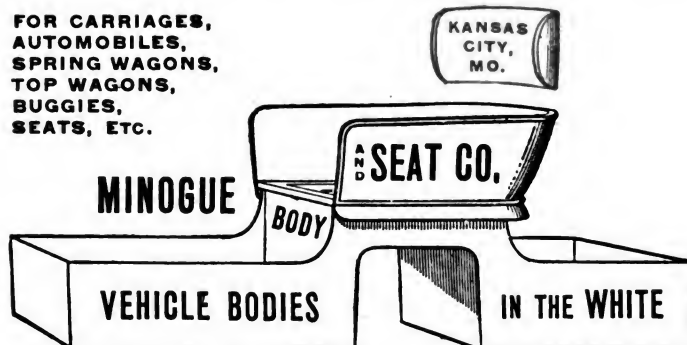
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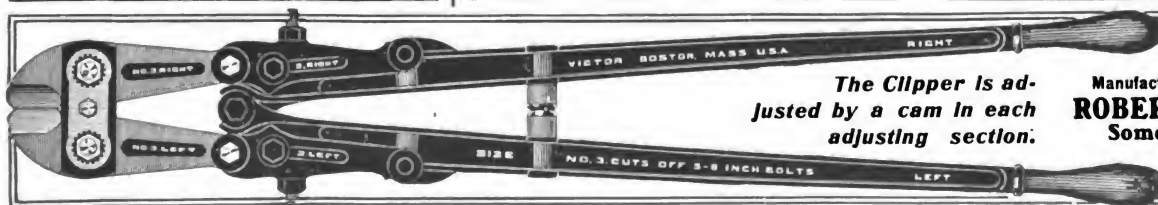
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SOLD CHEAP  
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Our N. Y. Representative,  
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**MORGAN & WRIGHT PADS**  
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**T**HE spring's the thing that does the business. Its pressure is constant and uniform—just sufficient to hold the coupling, with its leather packing, securely in place, and **TAKE UP THE WEAR**. The BRADLEY is the **ONE** and **ONLY** SHAFT COUPLING that takes up its own wear.

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Internal or Side-Wire Tires are the best tires that experience, training and intelligence can produce.

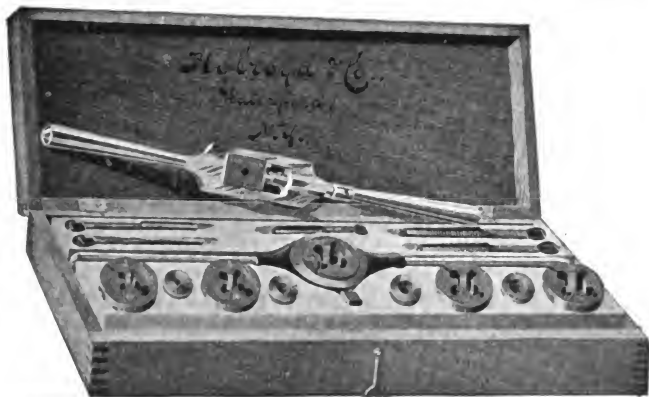
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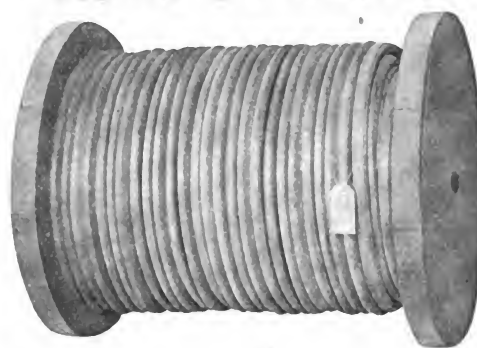
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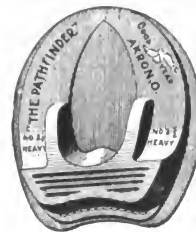
Our pads are the best, because they are correctly made; are made from the best rubber; easy to fit; all are guaranteed.

EASY.



Leather Back.

PATHFINDER HIGH.



Leather Back. Extra High Heel.

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# THE AMERICAN BLACKSMITH

A Practical Journal of Blacksmithing and Wagonmaking

VOLUME 5

OCTOBER, 1905

BUFFALO, N. Y., U. S. A.

Published monthly at 1838-1844 Prudential Building, Buffalo, N. Y., U. S. A., by the

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## To Extend the Foreign Trade of the United States.

The Department of Commerce and Labor, in an effort to still further extend the foreign trade of the United States, is establishing a comprehensive card index which will enable the department to furnish information desired by manufacturers or intending purchasers. To enable the bureau to prepare such an index, manufacturers and exporters of the United States are requested to furnish the following information: Name and location of main offices; location of branches; description of product; capital; capacity, per day, month or year; where product is sold (if abroad, countries and ports to which shipped); and any other information necessary to the proper listing of their business. Firms will assist the bureau very materially by forwarding the above information to Washington at their earliest convenience.

## The Most Work and the Best Work.

The man who does the most work and the best work in the least time is the man who gets the trade in these days of sharp competition. Time is worth money, but at no period has it been

worth as much as at present. The farmer with a mower to be repaired cannot wait a week for it. He must have it within the hour. The teamster must have his wheel repaired immediately. And so it goes through our modern year. What steps have you taken, Mr. Craftsman, to assist you in getting work out in time? Have you sat by and watched things prosper at your neighbors' or have you kept pace with the times? A man cannot gauge up to his full capacity without the proper tools to work with. You cannot afford to waste your time at an old, worn hand drill, neither can you afford to waste your strength pumping at an old bellows. If you desire to keep your trade and secure more, you must keep step with the god of progress. Make a point of promising work when wanted and then get it out when promised. You will undoubtedly need to strain a point to do this, but improved tools and machinery are of great assistance in this respect. They enable you to do better work in less time and more work in a given time. And this means more profits. Don't pay for your competitor's improved equipment by allowing him to take your customers away from your shop. Improved facilities enabling you to get work out in time will hold them and secure others.

## The Coming Volume.

This issue marks the beginning of the fifth year of THE AMERICAN BLACKSMITH and, as will be readily apparent after reading this announcement, it is our intention to make the coming volume better and of more value than ever before. The general policy followed in the past will be rigidly adhered to, i. e., reading pages for readers, and these to contain only such matter as is of direct interest to the craft. No trade puffs, stale clippings or matter of low standard will be allowed. Just coal and no sulphur, is our guarantee to subscribers.

In securing contributors, we have been especially fortunate, and it is with considerable pride that we announce to

our readers a series of articles upon the manipulation of steel, by one of the highest authorities upon this subject, Mr. E. R. Markham. We have been after the author of "The American Steel Worker" for some time, but not until this year could we induce him to contribute to our columns. Mr. Markham is without doubt the foremost authority in the country on the subject of steel, and our readers are assured of an interesting as well as an instructive series of articles by this able writer. The articles on steel start in this issue and will extend through the volume.

Another writer needing no introduction to our many readers is Mr. John L. Bacon, whose series of articles on the working of angle and channel iron starts in the October issue. Mr. Bacon, who is at the head of the department of mechanical engineering at Lewis Institute, Chicago, is not a new contributor to our columns, and no doubt many of our readers remember his articles. "The Elements of Blacksmithing," which appeared in our pages several years ago. The important subject of working angle and channel iron will be fully covered by Mr. Bacon in his series and we doubt if a more able writer could be secured for this subject.

Mr. J. Lawrence Hill and Mr. Nels Peterson will conduct the department of vehicle building and we hope to present to our readers many very attractive and distinctive styles in vehicle construction. Mr. M. C. Hillick, the well-known authority on vehicle painting, will continue to conduct this department and launches a new series of unusually interesting articles on the subject in this number. Contributions on railroad and machine blacksmithing may be expected from Mr. William B. Reid. Several other well-known authorities, with whom final arrangements have not yet been concluded, will also furnish practical articles for this department. Writings on general blacksmithing and difficult forging will be received from Mr. W. P. Woodside and Mr. C. Richardson. These writers need no intro-

duction, as their writings have already received the stamp of approval from our readers. The horseshoeing section will contain much matter of practical value to the progressive farrier and many articles will appear from writers of high standing. Mr. E. W. Perrin will continue his very practical and interesting experiences with actual cases.

We also invite our readers to write occasional items for publication. The progressive craftsman seldom accomplishes a month's work without running across something out of the ordinary. It is things such as these that we are looking for and we want you to let us know about them.

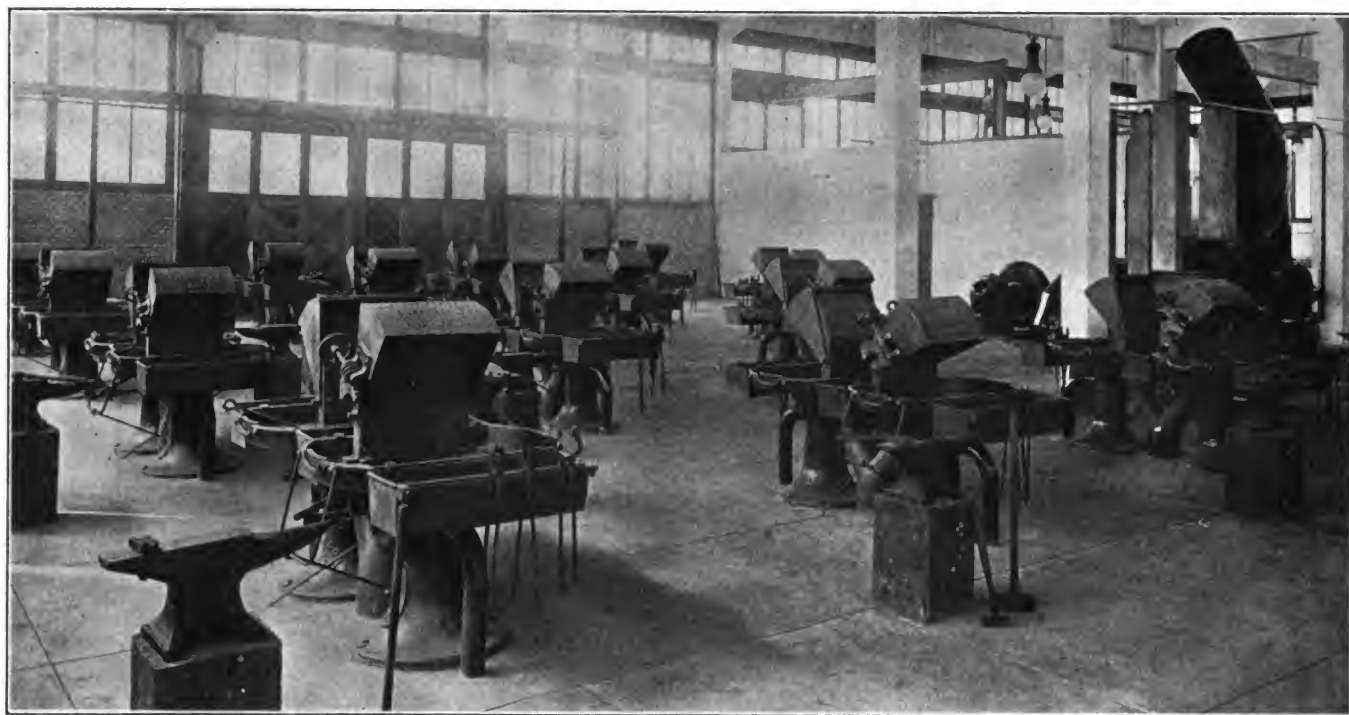
It is our desire to make the journal

extra heavy service; one 43-inch exhaustor direct connected to a 15-horse power General Electric motor; one blower direct connected to a 7½-horse power motor and one power hammer in close proximity to the forge for heavy work. The regular forges are arranged in pairs, back to back, and are supplied with a three-inch blast and a six-inch exhaust. The heavy service forge is set by itself and has a four-inch blast and an eight-inch exhaust. The anvils for each set of forges are arranged on opposite sides, as shown, so that there can be no possibility of one student interfering with another.

This forge room is well lighted, its air is pure and everything is conducive

stock by means of steady pressure instead of blows. A steel containing a sufficient amount of carbon to insure best results, when made into the general run of cutting tools is too high in carbon for cold chisels. To be sure, high carbon steels work nicely when made into cold chisels for die sinkers' use and similar work, but generally speaking tools which are to receive blows from a hammer should be made from steel which does not contain very much carbon.

When you get a satisfactory steel stick to it until you are convinced that there is something enough better to warrant your making a change; then change, even though the other costs twice as much; but, with the exception



THE IDEAL FORGE ROOM AT ANNAPOLIS NAVAL ACADEMY.

of just as much practical value as possible and with this object in view we request our readers to ask for special articles on any topic of craft interest. Numerous subjects have already appeared in response to such requests and readers can assist very materially by making their wants known.

#### The Forge Room at Annapolis Naval Academy.

The ideal forge room pictured on these pages this month is that of the United States Naval Academy at Annapolis, Maryland. Here the cadets are acquainted with the mysteries of metal forging. The equipment was installed by the Buffalo Forge Company of Buffalo, N. Y., and consists of twenty-nine down draft forges, one of which is for

to good work. The cadets are drilled in every class of naval work, although the equipment at this academy is much more elaborate than will be found on any ship of the navy.

#### Hardening and Tempering Steel.

E. R. MARKHAM.

Twenty-seven years of experience and study have convinced me that no one line of mechanical experience requires a greater amount of study and attention than the selection of steel for a particular purpose, and the proper method of manipulation in the fire and bath.

Experience has taught us that a steel whose composition would insure its giving success when made into cold chisels will not stand up well if made into cutting tools which penetrate the

of the alloy steels, there is very little difference in the price of any of the leading steels on the market.

Some men when designing tools are careful not to have any portions which might cause the tool to crack when suddenly contracted. If there were light portions adjoining heavy ones they would make the tool of the form shown in Fig. 1A, the change of size being gradual, while others would leave sharp corners and sudden changes of size, as shown in Fig. 1B. Still another man would make a tool leaving a shoulder inside directly in line with one on the outside, as shown in Fig. 1C, and then wonder why it cracked when plunged in the hardening bath. The experienced man does know and the

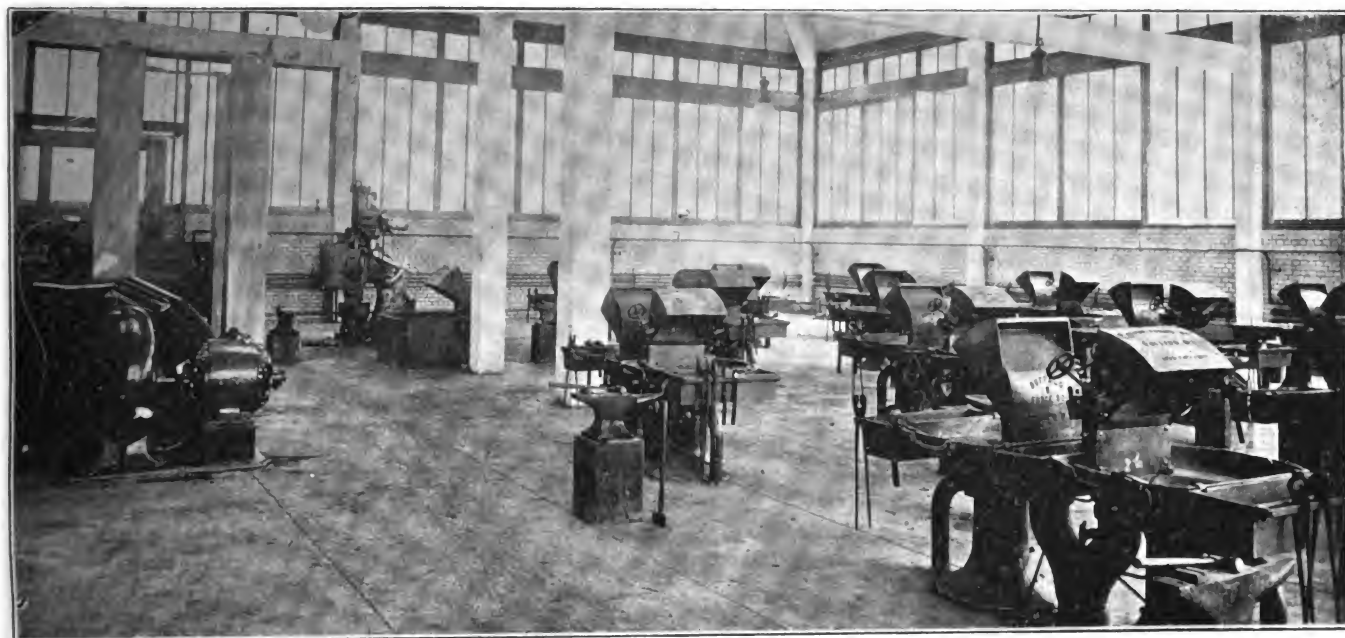
beginner should understand that steel expands when heated. If the process of heating is carried on properly, the expansion is gradual and uniform, and there will be no unsatisfactory results. On the other hand, a piece which is irregular in size and shape may be heated so rapidly and so unevenly as to crack in the fire. A piece of steel may be air cracked while heating in the fire. This is generally the result of heating in a blacksmith's forge, using a small fire, and is especially liable to happen when the fuel is nearly burned out. In this condition it does not impart sufficient heat to the steel in the fire and in order to get more heat a greater amount of "wind" is turned on. As the lighter portion of the tool becomes heated, the cold air from the tuyere strikes it and

when it is dipped in the hardening bath. Phosphorus is an element the steel maker attempts to eliminate, as its presence above an allowable limit causes brittleness, making the steel cold-short. This is especially true when it is in combination with carbon. The higher the percentage of carbon, the lower should be the percentage of phosphorus. Certain makes of high carbon crucible tool steel give much better results than others because there is less phosphorus in the steel and consequently the steel is stronger and better able to resist the strain incident to the sudden and violent contraction when the steel is quenched in the hardening bath. If sulphur is present in steel above allowable limits, it makes the steel red-short, that is, brittle when red

when the product is to be hardened.

Losing a tool when hardening is not always the fault of the hardener. The machinist or tool maker may render the steel unfit for use by straightening it when cold, or attempting to pene in some imperfection which is a result of his own carelessness. In the first case it would be almost sure to spring when hardened, and in the second the portion hammered would probably flake off in the bath or when the article was used.

If a piece of steel must be upset to accomplish a certain result, as in forging an end mill of the style shown in Fig. 2D, the upsetting should extend farther up the piece than the distance it is to be hardened. Serious trouble may result from attempting to harden a section where the "grain" of the metal does not



ANOTHER VIEW OF THE NAVAL ACADEMY FORGE ROOM.

cools it rapidly. The tool is again heated, and again it is cooled. This rapid expansion and contraction of the metal continues until the metal is covered with minute cracks.

Steel is a combination of iron and carbon, iron is the element we shape as desired, and the carbon causes it to harden so we can cut other iron with it. Steel contains other elements than those just mentioned. Among the more common are manganese, phosphorus, silicon, and sulphur. It seems wise to consider briefly the effect of these various elements on the steel. Manganese is present in all steel. Its presence to a certain point increases the strength of the steel, and confers better forging qualities. If the amount exceeds the allowable limit it causes brittleness and liability of cracking

hot, and so is liable to crack when worked under the hammer. Tool steel seldom contains more than the allowable limit of this impurity as its presence would be readily detected when rolling and hammering in the steel mill. The steel would crack while being rolled hot. In this respect it differs from phosphorus, which manifests its presence when the steel is cold. The presence of silicon has the effect of making the steel sound, but in high tool steel it should be at the lowest point attainable. A knowledge of the composition and peculiarities of steel enables one to select the cheap products of the Bessemer converter and open-hearth furnace when they will answer, and to discriminate against them when they should not be used. It is not always necessary to use crucible tool steel

all lay in the same course or direction. For instance, if it was found that there was no stock on hand sufficiently large to make the body, A, of the mill and it was necessary to upset this portion from smaller stock, instead of drawing out the shank as should be the case, the upsetting should extend far enough up the shank so it would be above any portion to be hardened. I have seen 6-inch milling machine cutters which were made from 5-inch steel, the upsetting being done with a sledge. When hardened, these mills cracked, the cracks running in all directions. Another set were, at my suggestion, upset from 4-inch steel, the upsetting being done under a steam hammer. When hardened by the same man and under the same conditions they proved to be all right. Upsetting steel that is to be



hardened is a source of much trouble unless it is done in a thorough manner. For this reason many steel-makers caution against upsetting, saying it should never be done. I have seen valve stems of the type shown in Fig. 2F, and made by upsetting a three per cent. carbon open-hearth steel, break when subjected to the jar and shock incident to their use. Yet this same style of valve stem showed no tendency to break when the smaller portion was

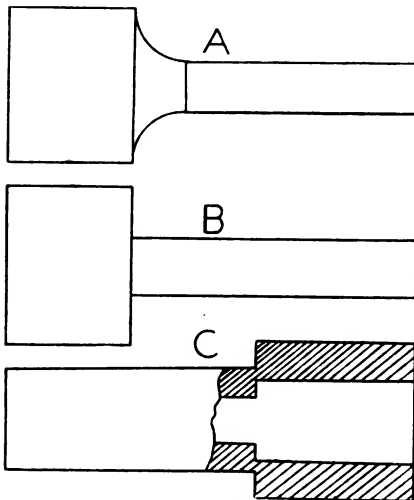


Fig. 1.—HARDENING AND TEMPERING STEEL.

drawn down from stock the size of the larger part. This latter method, however, could not be carried out, as the cost was prohibitive.

The surface of all tool steel as received in the bar is decarbonized—the carbon is burned out by the action of the oxygen. It is necessary to remove a sufficient amount of this surface or the exterior of the tool may not harden while the inside is as “hard as glass.” In the case of articles that are to be turned in the lathe, the stock should be centered true in order that an equal amount of this surface may be removed all around or one side will harden more than the opposite side, or one portion will be hard and another soft. Also, that which hardens the hardest will shrink the most, and if the piece is long it must invariably crook.

It is the custom in some shops to nick around a bar of steel and break it when a piece of a given length is wanted. If the steel is to be used for a tool having teeth on the end, as a reamer, cold chisel, this method of cutting from the bar should never be employed as the grain is fractured more or less at the end, and in this condition—especially after hardening—it is very weak and liable to flake off easily.

The word “temper” has a different meaning as used by the steel-maker

than when used by the hardener. In the steel mill it means the amount of carbon the steel contains. According to Metcalf the meanings may be tabulated thus:

Very high temper	.....	150	carbon. +
High	“	100 to 120	carbon
Medium	“	70	“ 80
Mild	“	40	“ 60
Low	“	20	“ 30
Soft or dead soft temper	.....	under	20

Then again the following terms are used by steel-makers: Razor temper (1½ per cent., or 150 points carbon). This steel being high in carbon is easily burned, and can only be placed in the hands of skillful workmen.

Saw file temper (1½ per cent., or 137 points carbon). This steel requires careful treatment, but will stand more heat than steel of 1½ per cent. carbon.

Tool temper (1½ per cent., or 125 points carbon). A very useful temper for turning tools, drills, and planer tools, and is the temper usually sold for all around tool steel.

Spindle temper (1½ per cent., or 112 points carbon). Used for mill picks, circular cutters, screw thread dies, etc.

Chisel temper (1 per cent., or 100 points carbon). This temper combines great toughness in the unhardened state, with a capacity of hardening at a low heat. It is well adapted for tools where one end must be hardened to cut and the other end left unhardened to receive the blow of a hammer, such as cold chisels, etc.

Set temper (¾ per cent., or 87 points carbon). This temper is adapted for tools where the surface only is required to be hard, and where the capacity to withstand great pressure is of importance, such as stamping dies, etc. However, according to American practice steel of much higher temper is used for stamping and pressing dies, and since the above list of tempers was given out, steel for most tools contains more carbon than was formerly the case. It has been found advisable to use the highest temper possible as a greater amount of work can be accomplished in a given time.

You will notice I have used the word *point* in connection with the word *temper*. It has occurred to me that possibly some of my readers may not be familiar with this term. A *point* is  $\frac{1}{100}$  of 1 per cent. of any element that goes into the composition of steel, so a 150 point carbon steel contains 1½ per cent. carbon. In the steel mills such a steel is spoken of as 150 steel. In most of my articles I shall use the term *point*, especially when speaking of the low grade steels which contain less than 1 per cent. (100 points) carbon.

I propose, in this series of articles, to deal with the various methods of annealing, hardening, and tempering, together with methods of heating, forms of hardening baths, etc.

(To be continued.)

### Plans for Making a Milk Wagon.

J. LAWRENCE HILL.

This is a very simple wagon to build. The sides and ends are perpendicular and the corners are all right angles. The sills A, Figs. 1, 3 and 4, are 5½ by 1½ good hard wood. They are dressed up

square and cut out for the doorway, as shown in the half bottom plan. B, Figs. 3 and 4, is a 1½ by ½-inch iron very securely screwed to the inside of A. It must be borne in mind in constructing milk wagons, that they are used hard in all kinds of weather. There is also a great deal of moisture around the cans and bottles, a large portion of which finds its way to the floor of the wagon. So it is imperative that great care be taken to fit all joints tightly, especially on the bottom, and to use, between joints, plenty of keg white lead, thinned very slightly with two parts japan and one part varnish bottoms. The life of the wagon and incidentally the reputation of the builder will be greatly increased by a little attention to the above facts. The front and back bars are connected with the sills by a mortise and tenon, this making a stronger job than a lap, providing the tenons fit the mortises. The standards and corner pillars are checked into the sills and bars, as shown in the half bottom plan. The side rails, D, are checked into the standards and pillars, F, from the outside, as shown in the side section in Fig. 3. These pieces are 1½ by ½ and with the exception of the top rail, G, the entire framework is even on the outside. The

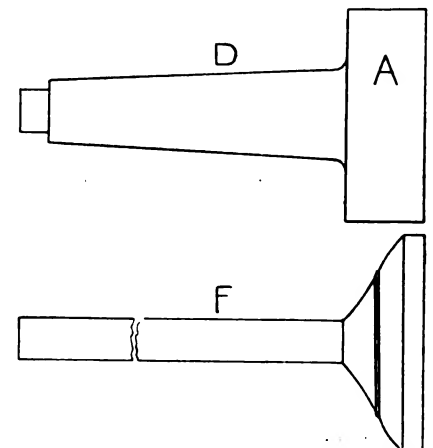


Fig. 2.—HARDENING AND TEMPERING STEEL.

three panels on each side are glued and braded to this frame, a moulding covering the joints, as shown in Fig. 3.

In Figs. 1, 2 and 3, with the exception of E, the full lines represent the mouldings and the dotted lines the frame. E is a one-inch half round iron screwed inside to protect the sides from the cans. The mouldings on the corners, both front, back and doors are of angle iron. This makes a very strong job and covers up the ends of the panels. This is especially necessary on the door pillars where the cans are very apt to tear wood to pieces. On the sill between the door posts also put angle

iron. This not only makes a strong job, but the corners do not wear thin and curl up as with flat iron.

The top rail, G, is 4 by  $\frac{7}{8}$ . The section in Fig. 1 shows how this will look from the ends. The rabbet on the lower outside edge is for the panel. The half top plan illustrates how the rail is fastened to the pillars. The top back-bar, H, projects  $\frac{3}{8}$  of an inch above the top rails, G, to allow for the roof slats, J, one of which is placed on top of G and the back end of each slat is let into H.

Over this is stretched a covering of canvas, rubber duck or some other suitable material.

This style of wagon is very frequently made without any doors or front window, such as the drawings indicate. The addition of these, however, is a simple matter and to the writer seems a very necessary one. The front windows can be made in two sections to slide from one side to the other. For this purpose bars made as shown by 1, Fig. 6, will be required. The thin strip

slide between them into the pocket. The frames, when down in the pocket, must be protected. To do so, put a  $\frac{1}{2}$ -inch panel across the frame that slides on the inside and bore three or four  $\frac{3}{8}$ -inch holes in the bottom of the pocket to let out what little water may get in. The doors are made to slide similar to barn doors. If you have four small grooved wheels, you can soon make all the fixtures required. Fasten a track to the inside of the top rail over the doorway and the width of the door back.

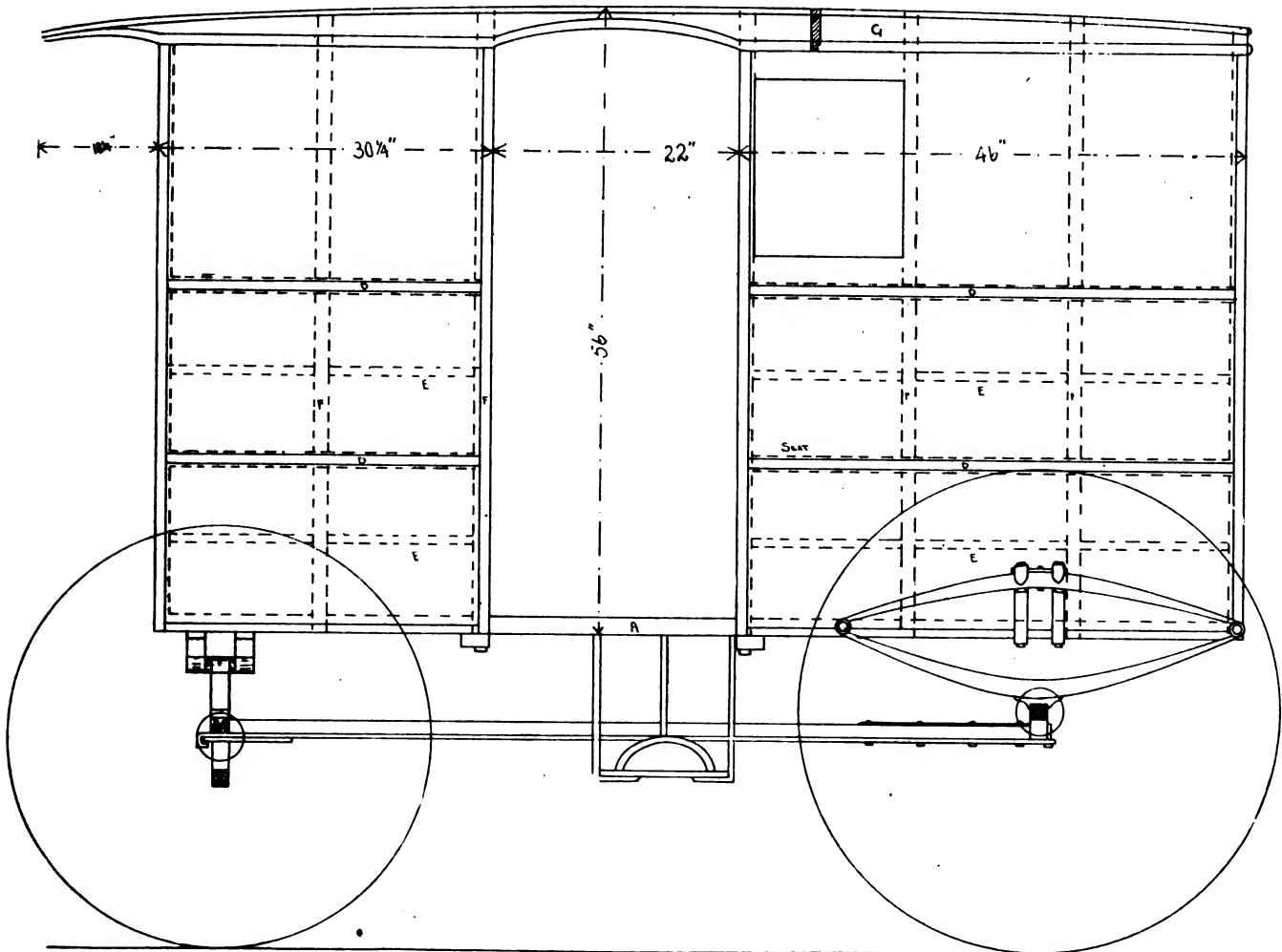


Fig. 1.—SHOWING SIDE ELEVATION OF MILK WAGON

This is shown more clearly in the section in Fig. 2. The top inside rabbet does not run the full length of the bar, as does the rabbet on the lower outside edge, which is for the back panel, but is only the width of each slat, J. This is made clear in the half top plan, Fig. 4. It will be seen that the top slats run over the inside edge of H. By this method no hole is left between the slats on the top of H. There are seven bows,  $\frac{3}{4}$  by  $\frac{7}{8}$ , in the roof, a bar across the front of the body, one,  $1\frac{1}{2}$  by  $\frac{7}{8}$ , in the overhand of the roof and H. Across these are placed eleven slats  $2\frac{1}{2}$  by  $\frac{3}{8}$ , having a  $\frac{1}{4}$ -inch brad on the under edge.

in the center is called a "fence" and is made of very light iron. The width of the bar is determined by the thickness of the window frames, which are usually  $\frac{3}{8}$  of an inch. The outside and inside guards are each  $\frac{5}{16}$  of an inch thick. Allowing sufficient room for the two frames and the thickness of the fence is in all about  $2\frac{1}{2}$  inches. The kind of bars required for a drop window is shown at 2, Fig. 6. This can be made for one or two frames. If two are used there must be a center post to divide them. The top bar of 2 is much lighter than 1. Also note that the middle bar is made in two pieces, as the frame must

To hang the doors, bend a piece of iron 1 by  $\frac{3}{8}$  inch in the form of a hook, put an axle through the wheel, rivet in the hook and fasten the other end of the iron to the door. A brass half round track fastened on the sill with a corresponding groove in the bottom of the door will always keep the door in position up against the side of the body.

The greatest drawback to vehicles of this kind is the space taken up in turning. That is when constructed in the regular way with the king-bolt through the axle. In order to obviate this, the king-bolt is put as far back of the axle as practical. At Y, Fig. 5, will

be found the top half of the fifth wheel. The four bolts shown run up, two on either side of the head block to fasten down the spring. The bottom half is shown at X and is attached to the axle bed. It will be noticed that the king-bolt is at the end of the center shank. The center of the bolt being  $6\frac{1}{2}$  inches

This is an improvement over the narrow clip, for they are continually working loose, due very largely to the small bearing they have on the axle.

There are three springs in front. The front view makes them appear like an ordinary elliptic but the side view, Fig. 1, shows that there are two half

seven inches, outside to outside of the springs. The rear springs are 35 by  $1\frac{1}{2}$  by 6 plates with a  $7\frac{1}{2}$  inside opening. They are  $42\frac{1}{2}$  inches apart on the axle. The center of the front wheels is 6 inches back of the front of the body and the center of the rear wheels is 19 inches forward of the back of the body. The wheels are 38 and 44 inches high,  $1\frac{1}{2}$ -inch spokes, 7-inch hubs, Sarven patent;  $2\frac{1}{2}$  by  $\frac{3}{4}$  steel tires;  $1\frac{1}{2}$ -inch steel half patent axles with a track of 4 feet 8 inches. The body is hung 29 inches from the ground. The bottom boards, C, Figs. 3 and 4, are 4 by  $\frac{3}{4}$  hard wood with a space between each to prevent water laying on them. The length of the body outside is 8 feet  $2\frac{1}{2}$  inches by 3 feet  $3\frac{1}{2}$  inches wide. The depth of the front axle bed is  $2\frac{1}{2}$  inches by  $1\frac{1}{2}$  inches wide, depth of head block 2 by  $1\frac{1}{2}$  wide and the reach is  $1\frac{1}{2}$  by  $1\frac{1}{2}$ .

For painting, a very rich cream color, bordering on a yellow is most suitable, though any color may be used. Some dairymen desire their wagons all painted alike with a color which distinguishes them from their competitors. One firm known to the writer has chosen for their color, a bright red and another a green, two very decided and conspicuous colors especially when employed on a large surface, but they have their value as an advertisement. If the cream color is used, it can be striped and lettered with a deep, yet light, blue and black. The cost of this wagon can be reduced by substituting canvas for the top panels, which can be made to roll up if desired.

#### The Value of Power.—1.

H. N. POPE.

"Good morning, Mr. Smith," said Austin, a good customer of the shop, bringing a job with him.

"Good morning, Mr. Austin," replied the smith, "how are you today?"

"Oh, I'm pretty well, but what kind of a thing do you call this?" said Austin, pointing to a queer shaped vehicle.

"Oh, that is an automobile, one of those things that goes around scaring your critters to death."

"Well," said Austin, "I have a machine here that auto-mow-hay, but it won't and I can't make it. Do you think you can fix it?"

"I think so," said the smith, looking at the mower. "A new knife bar, a broken Pitman rod. I can fix it in about two hours."

"How is that? The last time I was here you kept me all the forenoon and it took all day to make those pesky holes in the bar."

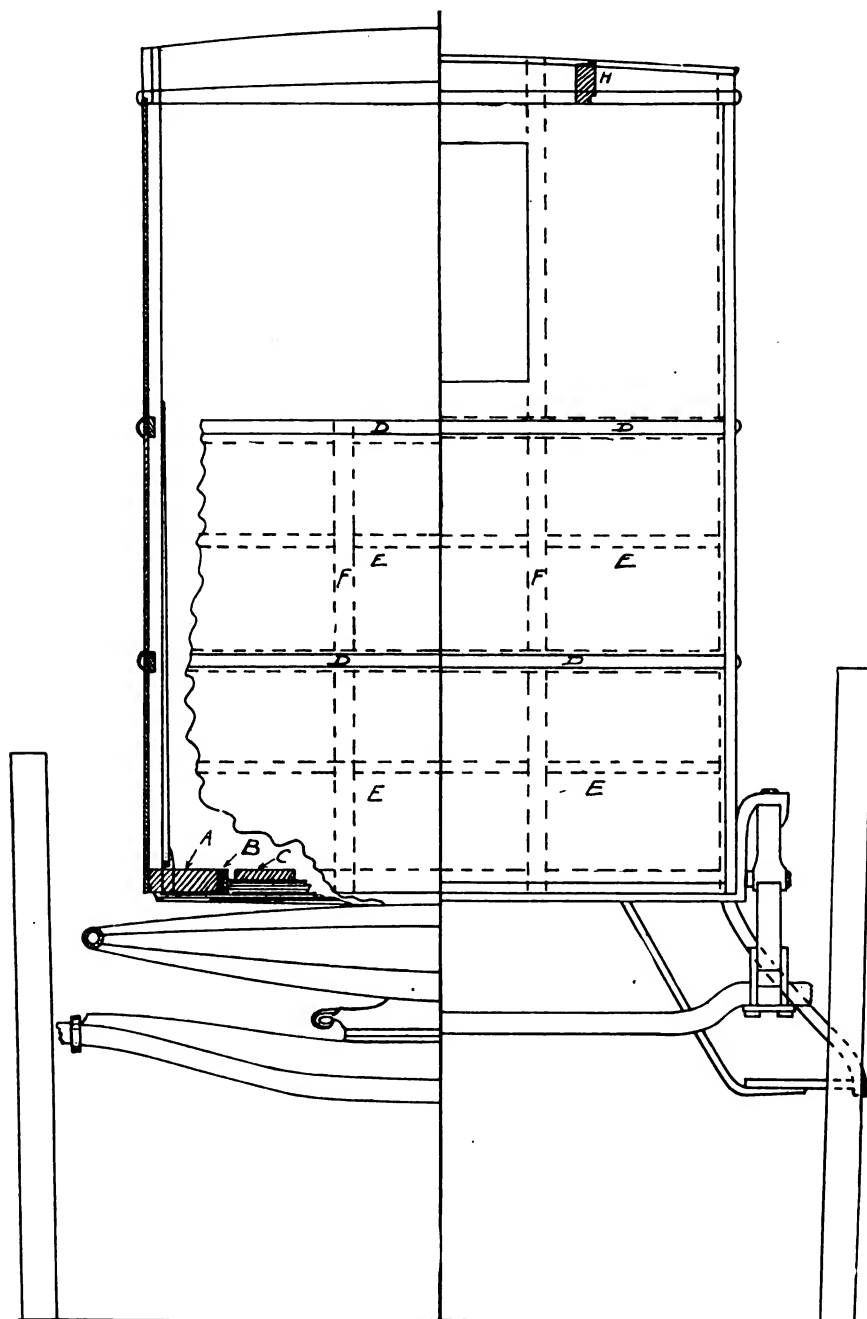


Fig. 2.—SHOWING HALF FRONT ELEVATION.

Fig. 3.—SHOWING HALF REAR ELEVATION.

back of the center of the axle, the bolt going through the reach instead of through the head block as is usual. On the front end of the reach plate is a hook which holds both the top and bottom parts of the fifth-wheel together. An idea of how these parts look when they are assembled is shown at W, in Fig. 5. The half plan of the gear, Fig. 6, shows how the axle brace is made.

elliptics on top, i.e. one on each side of the bottom half. A washer about  $\frac{1}{2}$ -inch thick is placed between each spring head, then the bolt, which should be  $\frac{1}{2}$ -inch, goes through the three spring heads and the two washers. The length of the front spring is 47 inches center to center of bolts,  $1\frac{1}{2}$  inches wide, seven plates in the bottom and five in each top spring, with an opening of

"Well, you see, Mr. Austin, I have some new machinery now."

"Yes, Henry said that you had a gasoline engine or something like that here and he has been after me to get

finally decides to buy one and put it on his old horsepower saw mill. Mr. Austin comes after the engine the next day and takes it home.

Now, let us see what Henry says

our berry patch. The over-flow of the tank in the attic I ran into a trough in the barn yard and from this over-flow I ran a V shaped wooden trough all around the berry patch, keeping close to

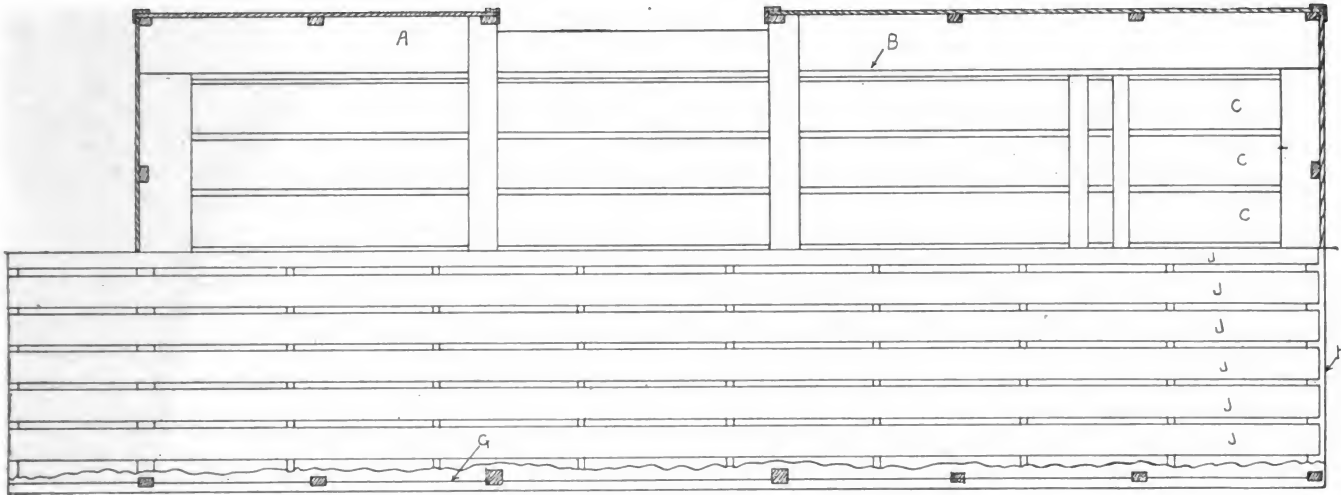


Fig. 4.—SHOWING HALF PLANS OF BOTTOM AND TOP OF MILK WAGON

him one. Says he has been studying it up and is sure that he can make improvements over home if he had one."

The head is quickly welded to the bar

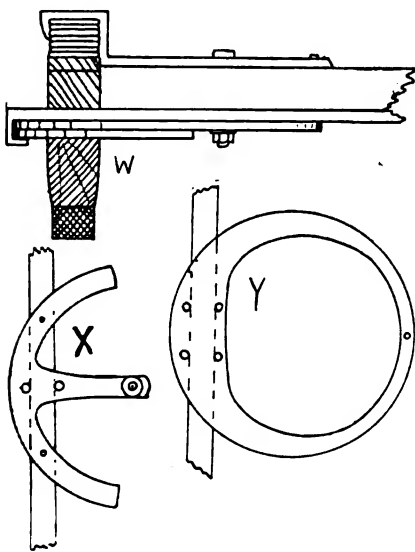


Fig. 5.—SHOWING DETAILS OF CONSTRUCTION.

and the rod mended while the boy is drilling the bar. Meanwhile the smith has given his customer a book illustrating the gasoline engine and its working possibilities. Just as the work is completed Mr. Austin comes out of the office book in hand. "Say, Smith, what is this and what are those men doing in that wagon?" It is quickly explained to him that it is a movable saw mill, one that is run by a small gasoline engine. Finally, after much explanation, Mr. Smith makes Mr. Austin the proposition that he had better buy one from him and let Henry do some of the things that he had been studying up. Mr. Austin

about it, "Yes, I was more than surprised when father came home with an engine. He always said that the old horsepower was good enough for what we wanted. The first thing that I did was to cut up all the wood for the winter. The way that saw walked through that big pile was a miracle. The next thing I set out to do was to get water into the house. Our well is quite a distance from the house and it always seemed to fall to the women to get the water. The first thing that I did was to build a small shed by the well and in this I put a pump worked by the engine. Then I built a tank up in the attic of the house. I had to get a plumber to line the tank and I also had him help me do some measuring for pipe. First I ran a pipe to the cellar and then up to the sink and continued the same line up stairs so we could have water both up and down stairs. Mother was away when I put that in and you should have

the fence so that it would not be in the way. In this way I distributed water over the whole berry patch. One other use that I put the engine to was getting water into the pasture lot. You know there is no water in that lot and in dry times it takes a lot of time to drive the cattle to water. In one corner of the lot I made a trough and in it made two sets of gates. One will, when the tank is full, let the water pass on and the other one will, when the tank is too low, open and let the water in. Yes, father is now satisfied that power is all right and a necessity on the farm and he also thinks that he made a good investment when he bought that gasoline engine."

(To be continued.)

### Working Angle and Channel Iron.

JOHN L. BACON.

The above term, angle and channel iron, is rather incorrect, as nearly all angles and channels are now rolled from

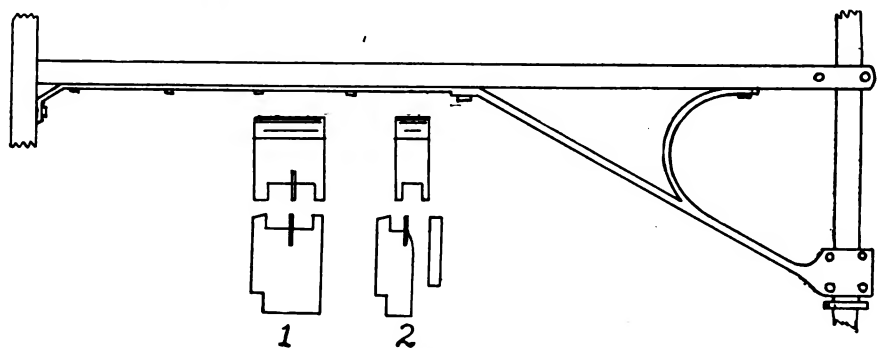


Fig. 6.—SHOWING DETAILS OF CONSTRUCTION.

seen the surprised look on her face when she came home and saw water right in the house. After I saw this was working all right I next planned to get water to

mild steel. In this article the methods of working given will be such as may be employed in a shop having no special equipment aside from the usual tools



commonly used for general work. The heating of angles and channels should be done with extreme care and very little blast used, as the edges of the flanges are comparatively thin and easily burned. When a long heat is wanted extending for some distance, the angle or channel should be placed on the fire with the flanges down if possible, as shown in Fig. 1. In this position the work acts as a sort of flue for the flames, causing them to travel along under the bar for some distance. If a short heat is required, and for some reason it is necessary to place the work with the flanges down, damp coal should be packed up under the bar on each side of the fire, to prevent the action described above. Whenever possible where a short heat is wanted the bar should be turned with the flanges up, the fire then not having such a tendency to spread. When an angle or channel is bent the

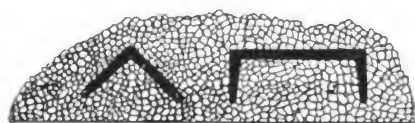


Fig. 1.

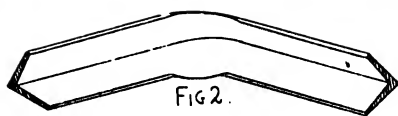


Fig. 2.

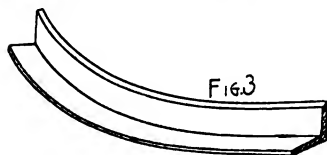


Fig. 3.

Figs. 1, 2 and 3.—WORKING ANGLE AND CHANNEL IRON.

stock has a tendency to flatten out or buckle at the bend, somewhat as illustrated in Fig. 2. Success or failure in bending depends to a large extent upon the ability of the workman to overcome this buckling.

One of the easiest bends to make is a long sweep with the flange out, such as shown in Fig. 3. Angle iron may be easily bent in this shape by taking as long a heat as possible, placing the work on the horn of the anvil, and striking gently down upon the projecting end with a heavy hammer, as shown in Fig. 4, A. The other end of the bar should be "backed" with a heavy sledge while bending. The upright flange will generally buckle to some extent, and should be worked down flat with a set-hammer or flatter, in the manner shown in Fig. 4, at B. Each heat should over-lap the last if a smooth curve is wanted, and care must be taken not to have any short bends or kinks. Channels may be bent in the same way,

but when straightening the flanges it may be necessary to work over the tail of the anvil, as shown in Fig. 4 at C. Several pieces of bent angles and channels are shown in Fig. 5. The channels shown were bent over the

well when bending with either the flange inside or out is shown in Fig. 6. When bending this way the work may be left in the fire and the bending done by tightening on the differential chain block. Very light work may be bent

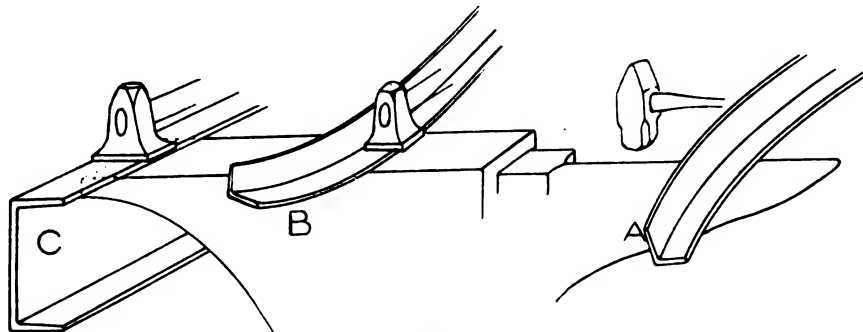


Fig. 4.—SHOWING VARIOUS METHODS OF BENDING.

anvil alone, in the manner described above, without the use of any forms.

Shorter bends may be made in the above manner, but for very short curves it is almost necessary to have some sort of form to bend over. Curves may be bent without a form, when the flange is on the outside, to a radius about equal to the width of the flange, provided it is not necessary to keep the flange up to its full thickness on the outside edge. Bending stretches the metal and thins out the projecting edge to quite an extent and the shorter the bend the thinner the flange. Long, heavy pieces may be bent by heating the work, supporting one end, and raising and dropping the other end repeatedly on the floor or on a bar or block of iron. The weight of the bar will do the bending, the length and location of the bend being determined by the heating, the stock being heated most where the greatest bend is wanted. Bending may also be done by supporting the

ends of the bar and striking down on a set-hammer or flatter held at the point to be bent. Another method which works

in the fire by pulling with the hands alone. It is of course necessary to start the bend in the usual way, and the straightening is done on the anvil.

When bends are made with the flange inside, the bar should be supported as shown in Fig. 7, not on the thin edge of the flange. Buckling is prevented to some extent in this way, while if the bar be bent while resting on the edge there is

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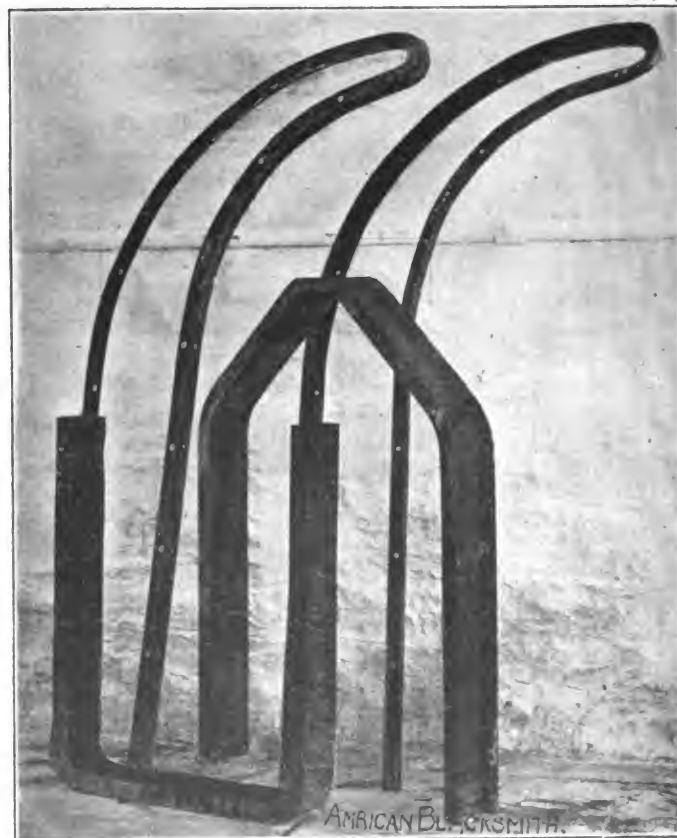


Fig. 5.—SHOWING EXAMPLES OF WORK BENT WITH THE HAMMER.

a tendency for the side A to fold in toward the flange. Aside from this precaution, bending with the flange inside is done in practically the same

well when bending with either the flange inside or out is shown in Fig. 6. When bending this way the work may be left in the fire and the bending done by tightening on the differential chain block. Very light work may be bent

way as when the flange is outside. When a very sharp corner is wanted, with the flange inside, an easy method of making is shown in Fig. 8. A piece is cut from the flange, the edges scarfed

I first located here there were some persons inquiring as to my ability in blacksmithing. Some time ago there was a welding job that had been to all the smiths in town. They said it couldn't be

scarfing them. It occurs to me that I might say a few words in regard to welding two pieces of metal at the anvil; it matters not whether it is a spring, an axle or a bolt. I believe that if proper attention is given to the way in which the scarf is made and how it is held on the anvil while making the weld there will be less failures in doing this class of work. Of course a good clean welding heat is the main factor in the case. The scarf which I think is the best on a lap-weld is that which is made slightly convex at the center. Such a scarf when put together will first unite at the center and from there out, making a good clean job. On the other hand, if a scarf is left hollow or with large dents, the dirt or flux is held in the pocket thus forming and keeps the scarf from welding at that point. The outer surface of such a weld may look all right, but if broken apart when cold, a black space will be found that did not weld. This is what I would call "a loose weld." The scarf should therefore be made full at the center and a good heat taken. The piece that is placed on the anvil should project over the edge of the anvil next to the smith, about  $\frac{1}{2}$  or  $\frac{3}{4}$  of an inch, and be held there by the helper, so that the thin edge of the

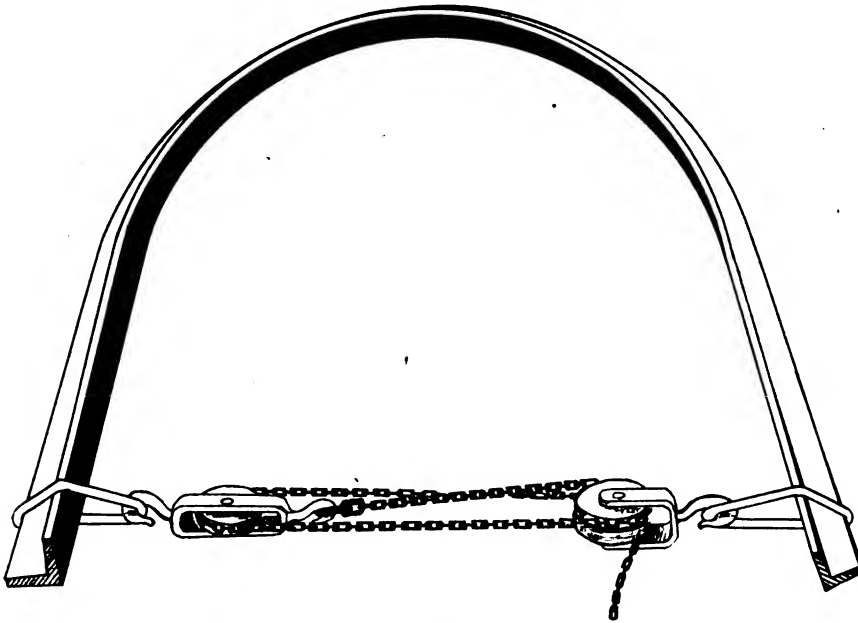


Fig. 6.—SHOWING METHOD OF BENDING WHILE IN FIRE.

with a fuller or the pene end of the hammer, the corner bent and forged sharp, and the flange welded. Before welding, the sides of the angle should be bent slightly closer together than the finished piece is to be, as the welding stretches the metal in the flange and spreads the sides. When the work is not very particular, or no very great strength is required, a piece may be cut from the flange and the sides of the cut left as square as possible. The sides are then bent and forged together but not welded. When carefully done the joint is smooth and hardly noticeable and for many purposes is satisfactory.

(To be continued.)

### The Practical Value of a Good Craft Journal.

WM. R.

The rest of the craftsmen in this part of the country are old timers and don't

done, so one of them said: "Let us take it up to the new smith and see if he can weld it." They brought it to me and asked me if I could weld the shaft. It was of  $1\frac{1}{2}$ -inch steel. I picked the pieces up, looked at them and asked who had been burning it. One of the men said: "We have been to all the smiths in town to get it fixed, so we decided to bring it here and give you a trial at it." I measured the shaft and found it was four inches too short. I told the boys I would have to put in a piece four inches long as the other smiths had burned it. So I went to work at it. I first cut off the burned ends and then got a piece of steel the same size. I made the first weld all right and the second was just as easy. They were greatly surprised and wanted to know where I learned my trade. I told them I was up-to-date in the business because I was a regular reader of THE AMERICAN BLACKSMITH.

### A Short Talk on Welding.

BY FARNHAM.

I have noted the different methods discussed in the columns of THE AMERICAN BLACKSMITH in regard to welding springs and axles and the method of

scarf will not become chilled by resting on the anvil. The top weld should now be made by the smith and then quickly turning the piece over and at the same time pushing it to the middle of the anvil where the helper should bring his sledge into play. This, with reasonable speed and good heat, should give a good, sound weld. I wish some brother smith who is not already familiar with this method of welding would try it and let us know what he thinks about it. By so doing all may derive benefit from the experiments at our own forges. I would like to see more of this spirit.

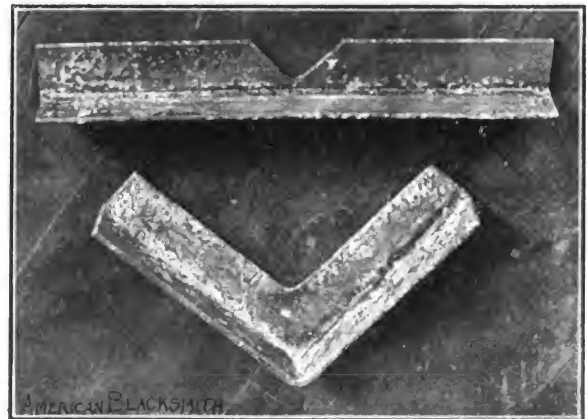


Fig. 8.—SHOWING METHOD OF BENDING SHARP CORNER.

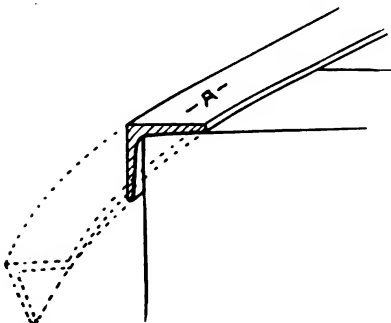


Fig. 7.—SHOWING HOW TO SUPPORT THE BAR.

believe anybody can tell them anything about blacksmithing. But I have opened the eyes of some of them. When

**Persevere.**

ANONYMOUS.

Drive the nail aright, boys,  
Hit it on the head;  
Strike with all your might, boys,  
While the iron's red.

When you've work to do, boys,  
Do it with a will;  
They who reach the top, boys,  
First must climb the hill.

Standing at the foot, boys,  
Gazing at the sky,  
How can you get up, boys,  
If you never try?

Though you stumble off, boys,  
Never be downcast;  
Try and try again, boys,  
You'll succeed at last.



A wish bone will never take the place of a back bone.

He is wise who makes provision now for the days of wintry blasts.

Patience is a great virtue, provided it is not another name for indolence.

No one said you could get all the business, but, are you getting all you might?

Get-a-head apprentices don't force their bosses to do all their thinking for them.

Our chief worries are over things that never happen. How often is this the case?

At least once a week the careful gas engineer examines every nut and bolt on his engine.

The smith who tries to keep track of all his business in his head alone, usually loses both.

Something wrong with your business? There must be cause. There is a remedy. Investigate.

Making and repairing finger rings is the latest in the side-line field. What have you taken up for more profit?

It's not your strength, education, money or aptitude, but what you are doing with these that makes for real success.

A new volume has started. Don't fail to be represented in one of its numbers by a good, practical smith-shop article.

Let the boy earn some Christmas money by getting subscriptions for THE AMERICAN BLACKSMITH. Write for particulars.

There is a good opening at Milton, Delaware, for a carriage painter and wheelwright. Communicate with Mr. I. C. King, if interested.

Fifty thousand tons of welded chain were manufactured in this country last year, making the United States the largest producer in the world.

Steel ties are being laid on ten miles of the P. B. and L. E. R. R. in a test of their value in comparison with wooden ties. The road has ordered 2,100 tons of these ties.

The busy business man early learns to cut out all unnecessary steps, to avoid going over the same thing twice, to think clearly and decide quickly. The blacksmith must be a business man.

The apprentice question—does it affect you? For many, a gas engine has solved the problem effectively. The wage it asks is small, the work it does is great. It seldom grows, and never goes on strike.

Thornton was asked about his success with employes, but he simply pointed to a neatly printed card over his office door. "I cannot afford to keep an employee who hasn't my interest always at heart."

Like mists, most of our troubles are formidable at a distance, fading to nothing before the sun of courage and determination. Each one successfully overcome adds to our strength and ability to vanquish others.

"My Buffalo herd has stampeded—please chase a few my way," writes a progressive western smith. We immediately sent another batch and are waiting to do the same for you when in need of the little pink squares.

A nice, big house with other comforts of life in proportion is the lot of a retired Ohio smith of our acquaintance. The formula for getting ahead, he writes, is: "Buy close, collect sharp, charge a right figure and never cut prices."

A prominent smith of a booming western town has a sign hung in his shop reading as follows: "If you want to know how business is, who's going to be elected, how my health is, how crops are, come in tomorrow. Business only, today."

"First meetings should be called early in October, so as to get things into working order before sharpening time," says an officer of the American Association. Start now—immediately—to get in touch with association work in your county.

Every rung of the ladder has its opportunities, making the most of which helps to the rung above. Don't think there is room only at the top. That man is always in demand who can do some job, no matter how humble, a bit better than anyone else.

A Winnipeg, Canada, blacksmith has discovered a process for welding copper. It is said the process has been thoroughly tested and found perfect, and that the copper can be welded to copper or other metals without impairing the electrical conductivity and other properties of the metal. The process is said to be very simple and no more costly than the welding of steel. The work can be done with a forge, blowpipe, or any apparatus which will heat the metal cherry red.

A new mineral has been discovered by a German mineralogist. It does not correspond to any of the mineral combinations so far known, but resembles mostly combinations of garnet, having similar regular crystals, and contains many rare earths.

The chief components are cero, lanthano, and didymo oxides, and it may be of use for the manufacture of chemical products. The discovery was made during a scientific exploration in southern Russia. The mineral has been named Beckolith.

Over at Tom's the other afternoon we found the shop in the worst condition yet. He explained that the brick work over his fire had come down and at a time when he was busy. Of course, his customers had to go to Brown's shop up the street. Upon investigation we found the falling bricks had punctured the old battered and patched bellows. We could not resist the temptation to administer a lecture upon modern tools and appliances. But all Tom said was: "I don't go much on them there new fangled blowers and forges. They're all right in their place, but I haven't no place for them," and we couldn't help but agree with our friend.

A novel process brought to light recently is the use of oxygen to cut iron plates. In cutting, an oxyhydrogen blowpipe is directed against the portion of a beam to be cut, which is thereby heated to whiteness. The current of oxyhydrogen is then cut off and a current or blast of oxygen turned on. The two blowpipes follow each other at a distance of about one inch, the rate of travel being eight inches a minute for a plate one-half inch thick.

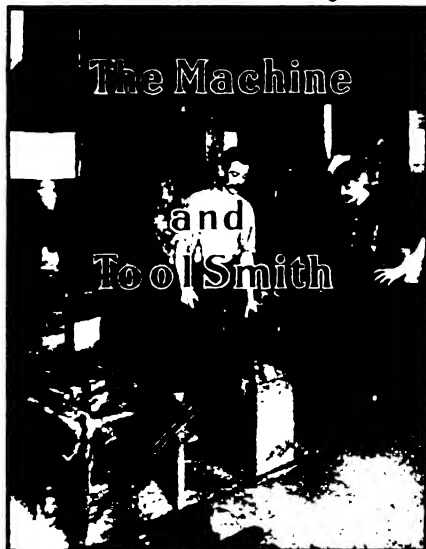
The cutting line is said to be smooth and quite minute in width. For cutting larger beams and slabs of iron in places where a saw cannot be utilized, the oxygen process has many advantages. A cut can be made in metal up to four inches in thickness and a yard long in about 10 minutes. The cost would, of course, preclude its use where machinery is available and can be applied.

A new process of galvanization has been invented by an Englishman, who has recently demonstrated the same with samples of iron, copper, aluminum, and other metals. The objects to be galvanized are simply heated to 260° in a bath of zinc vapor, the duration of which depends upon the desired thickness of the coating, but which is always short. After heating, the objects are thoroughly coated with a layer of zinc, which on the surface has formed an alloy with the other metal by penetrating into it to a considerable depth. A copper rod can in this way be almost entirely transformed into brass, while the temperature employed remains far below the melting point of both metals. A great advantage of the process lies in the evenness of the coating, which is so perfect that such zinc galvanized screws and bolts afterwards fit perfectly into the nuts, while with other methods they have to be polished. It is also very convenient that the objects to be galvanized have not first to be cleaned. The retorts in which the heating takes place are of iron, and are heated from the outside. Another peculiar advantage is that the zinc does not adhere to the walls of the retort, but that these, after months of use, are entirely clean. The explanation for this is that the walls of the retort are heated most, so that no zinc vapor condenses on them. Experiments to use the process with metals other than zinc have been so far made with copper and antimony, and have been partly successful, but not to a degree to make them of practical use.

### American Association of Blacksmiths and Horseshoers.

After the inertia of the past summer, smiths all over the country are showing a greater activity than ever in the organization field. The success of our efforts last season should urge those whose locality cannot boast of a protective association, on with renewed vigor. The craft needs organization and wants it. It lies with you to get the ball rolling. Your competitors will ever thank you for your lead. Don't be afraid of their not following. They are waiting for you. Why not answer the call. Send in for our plans. We will assist you and help you over the rough places until you are able to go alone. Address us—P. O. Box 974, Buffalo, N. Y., and we will show you how easily an association may be started, prices raised and the standard of the craft in your locality brought to a higher level. Other branches of trade have associations and are protected—why not the smith and shoer? If anyone deserves it they do and it is up to the individual members of the craft with concerted effort to demand fair and square treatment. What will you do, brother? Stand idly by or will you put on your share of the harness?

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### The N. R. M. B. A. Convention.

The National Railway Master Blacksmiths' Association held its thirteenth annual convention at the Forest City House, Cleveland, August 15th, 16th and 17th. There was a larger number in attendance than ever before in the history of the organization.

The meeting was opened with prayer followed by an address of welcome by Mayor Tom L. Johnson and the President's greeting by Thomas F. Keane. Mr. W. W. McLelland of Denver

presented two hundred dollars to the association. The name of the organization was changed and is hereafter to be known as The International Railroad Master Blacksmiths' Association. Chicago was chosen as the meeting place of the next convention and the following officers were elected for the ensuing year: President, David B. Swinton, of the Canadian Pacific, located at Montreal; First Vice-President, John S. Sullivan, P. D. & St. L. R. R., Columbus, Ohio; Second Vice-President, G. H. Judy, B. & O., Pittsburg; Chemist, G. H. Williams of B. M. Jones & Co., Boston; Secretary and Treasurer, A. L. Woodworth, C. H. & D., Lima, Ohio.

The various subjects for consideration and discussion were thoroughly covered. A few of the reports are given: Repairing Worn Out M. C. B. Coupler Knuckles.

In our 1901 proceedings there were a few remarks made by Mr. Burges about bent M. C. B. coupler knuckles being repaired, but I have not noticed anything about repairing worn out knuckles. On the road I represent, we are having very good results with repaired worn out knuckles and I would like to give the members of this Association the benefit of our experience.

We have in use at the present time over 1,000 worn knuckles, that have been repaired in blacksmith shops. They are giving good satisfaction, in fact, we expect as long a life from the repaired knuckles as when they were new. Some members might wonder how this could be done, but after it is explained it will be understood.

In the first place, the point of contact with lock block is worn to a smooth fit, and is not likely to wear as rapidly as a new knuckle at that point. Secondly, as we plug the link pin hole solid, it will last until the knuckle is fairly worn out. In the case of a new knuckle, as soon as the face is worn to within about  $\frac{1}{4}$  inch of the coupling pin hole it begins to flatten and consequently has to be removed. We have also repaired knuckles which were only worn about  $\frac{1}{4}$  inch, which goes to show that there was something wrong with the contour line in the first place.

Our practice is to heat the wearing face of the knuckle around the coupling pin hole, keeping the knuckle pin hole and lock end cold. When brought to a proper heat, which is a nice red, a piece of  $1\frac{1}{2}$ -inch iron about  $\frac{3}{4}$  inch longer than the depth of the knuckle is driven through the hole. It is then put back in the fire and heated again. When hot, the piece is riveted on both ends. The knuckle is then placed under the steam hammer with hot side on bottom block. A few light taps will close the knuckle until it has taken up all that was worn and forming a correct contour at important parts. We then try it in a new coupler and test it with standard gauge, giving it about  $3\frac{1}{2}$  inches from face of coupler to inside of knuckles. We also try a new knuckle along with the old one to make sure that it will lock all right with another M. C. B. standard coupler. A blacksmith and helper will repair from 25 to 30 per day in this manner. This applies to knuckles with coupling pin holes and link slots. D. B. SWINTON.

### Best Material and Method of Forging Motion Work.

I favor the use of scrap iron for all this class of forging. I select the scrap and use

nothing but the best of iron. I do not favor machine steel for two reasons: First, it would be an outlay of new material, and second, I think after you case harden steel once or twice it becomes brittle and would be very easily broken. We forge links from the furnace by blocking down iron to about the size wanted; form with fuller; reheat to good heat and finish in the former or bottom die to fit the class of link wanted. Lifters we make in the same way out of good scrap iron by blocking out the center, reheat and finish ends in hammer-sledge and then draw to proper length. Blocks and plates are made the same. Valve yokes we make from scrap iron, by blocking out backs and turning down the ends. The fronts are made the same way. Then weld in stem and lap-weld yoke in the center of the end. I find if stems are properly welded you have a cheaper and better yoke than by forging solid in the black.

Rocker arms we make by upsetting the band for collar and welding on the arms. I do not think this makes as good rockers as forging them solid, but taking in consideration the cost of making them solid, I think it is the better method.

Of course I cannot discuss the use of upsetting machines for this class of work, for in most all repair shops we do not have a machine large enough to do this class of work, so I will leave the subject for those who have had experience in that line. I do not favor welding anything that has to be case-hardened, if it can be avoided. Blade forks we make of scrap iron by blocking out under the hammer, with fuller cut of right length; nick in with sharp chise about  $\frac{1}{2}$ -inch deep all around for forks; when a dull red heat place over steel die and stamp and it is ready for the machine.

I fear you will gain but little from what I have said, but I have given you the best methods I know according to my limited experience. W. E. GARNER.

### Best Material and Methods of Forging Motion Work.

As this association adopted a resolution and went on record at our 11th annual convention, to recommend the usage of steel for rods, rod straps, crank pins and piston rods, I took it for granted that this committee was to report on the link and valve motion only. With this in view I sent a request to every member of the committee asking for their views and experience on the matter. I received but three answers to my letters, two of them being requests to be excused as they could not possibly serve on the committee. One, Mr. W. E. Garner, sent a letter giving his views and methods of doing this work. As his views and mine are so nearly identical with the methods recommended by the committee at our last convention (Messrs. Sullivan and Uren), I do not think it necessary for me to make a detail report, for in so doing I would simply have to repeat every main point covered in their report.

Mr. Garner and I differ on one point and that is in making the valve yokes. We make them the same way with the exception that he welds the stem to the front part of the yoke, while I favor making them as recommended in last year's report—to draw out part of the stem from an ingot large enough to make the front part of the yoke by punching a hole near the stem and split open in center; bend the sides, one each way; then reheat and put in a tool made for the purpose. A few blows with the hammer will make it the shape of a T, after which it is drawn down in the usual way, just as handy as if it were a straight piece of iron; bend ends over and weld the yoke in the center at the ends.

This method takes but a little bit longer



than to jump the stem on and I think it far the better way.

For the benefit of any new members that may be present I would suggest that Messrs. Sullivan and Uren's paper on motion work of last year be read to the convention, as that fully conforms with my views both in material and methods. J. B. ANDERSON.

### A Practical Talk on Iron and Steel.

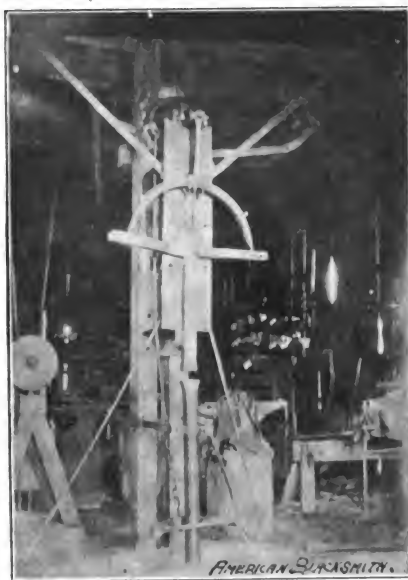
C. H. RICHARDSON.

Why is it necessary to use a flux when welding should be well understood by all blacksmiths? The point of fusion, or melting point, gives to the experienced workman the knowledge he requires to work the material placed in his trust. Iron in the state it comes to the average shop is composed of about 75 to 80 per cent. pure iron, 10 to 15 per cent. carbon, and 5 to 10 per cent. phosphorus, manganese and silicon. This composition's fusion point is 2,900 degrees Fahrenheit. But if the percentage of any of the alloys is increased, the melting point is lowered to the fusing point of the most prominent alloy in the composition. In making tool steel, the iron in many cases is brought to the melting point before the alloys are added. This is done mostly when making high speed tool steel.

Heat as produced in the common forge fire, has all the impurities still in it when it strikes the material. Phosphorus and sulphur are the elements that cause the most trouble. A high percentage of either of these elements is considered by all steel and iron makers to be dangerous to the material, and they strive to eliminate them as far as possible. The United States Government requires in all its specifications, that no more than from three to four one thousandth of one per cent. of phosphorus shall be contained in any armor plate. Our object then is to protect the iron or steel from these impurities that are ready to amalgamate with those all ready in the material to be worked.

If the forge is of brick and shaped like a bridge-wall furnace so the flames lick over the wall and ignite the gases in the combustion chamber (this space left between the bridge wall and the side of the furnace is the hottest part of the entire furnace), 50 per cent. of the fuel would be saved and a large percentage of the gases would go out without coming in contact with the metal at all. These gases as a rule are higher than the oxygen, the gas that supports combustion. The iron or steel is also protected from the slate and slag. So it has been proved by all blacksmiths through their own experience, when it is impossible to get a brick enclosed fire for

steel welding that a fire which has been used for a short time, or in which the green coal is burned to a soft coke, is best for welding. The smith's object is to eliminate the sulphur, or to get a good charred fire. He will continue to blow his fire and enter quart after quart of water on it. This seems a strange thing to the inexperienced to do. I remember when a boy and doing this very thing, a stranger visiting the shop asked me how I ever expected to get the fire burning if I continued throwing on water. I laughed at him and said I did not know why I did it, but my father taught me this way and it has always come out all right. I told him if he would wait, he would see for himself. He said that he thought that it was a waste of time and money.



ANOTHER HOME-MADE POWER-HAMMER.

The reaction that has taken place during all this wetting and blowing has eliminated the sulphur and other impurities to a large extent, and has left a new element called carbon. This is a foundation for combustion. The other element that combines with carbon to make heat is oxygen. It is forced in the forge by the blower pressure, unites with the lighted carbon (or coke) and supports it, forming a perfect combustion. As the material heats to the melting point it absorbs a large amount of the carbon. In steel manufacture, carbon is the element most sought for, i. e., to develop hardness. The larger the percentage of this element, the harder the steel, and therefore the greater resistance to friction.

It is very apparent that the alloys cause the trouble when welding. For instance, iron gives very little resistance when welding, there being scarcely any

carbon, about 10 to 15 per cent. Mild steel, such as tire, angle and boiler plate steel, containing about 20 to 40 per cent., is harder to weld. Next are the different grades of tool steel, ranging from 40 to 80 per cent. These require all the care that can be given while heating for welding, to prevent a surface fusion before the center of the piece is hot. The greatest assistance to the smith by which to overcome this obstacle are the different compounds consisting chiefly of borax, fire clay and plaster of paris. While any one of these substances can be used alone, they are as a rule compounded.

### A Home-made Power-Hammer and Some Texas Prices.

J. A. TURRENTINE.

The accompanying engraving shows our shop-made trip hammer. The face plate is of plow steel  $\frac{1}{4}$  by 10 inches. The hammer is a piece of 2 by 2-inch rod steel flattened on one end for the hammer proper and fitted at the top to receive the links that connect it to the spring. The spring is an old buggy spring worked over. The connecting rod is made of a buggy axle, after the plans of the hammer which appeared in THE AMERICAN BLACKSMITH several months ago. The frame is of 4 by 6 pine. I would prefer, however, a single piece of 10 by 10 and let into the ground deep enough to hold it steady. The flanged pulleys we made by shrinking on bands set edgewise. With this hammer I can do about 75 per cent. of the forging, all of the plow sharpening and do the work a whole lot better than can be done by hand.

We blow our two fires with a Royal blower by using a branch pipe to each tuyere iron. We put a pulley on it in place of the crank and it makes all the wind we want. We have a 2 H. P. Fairbanks-Morse engine that pulls the trip hammer, emery wheel, blower and drill. We expect to put in a band saw this fall. With the drill worked over from hand to power use, all the slavery of that old misery mill is gone, and I can now sit down in front of it and drill  $\frac{1}{4}$ -inch holes and feel good all the time. The extra attachments on the drill cost us nothing. The trip hammer cost us about \$18.00 and my emery stand cost \$16.00 all told.

We do much brazing of broken machine parts and never experience any trouble brazing cast iron. I use boracic acid as a flux instead of borax. We have a House cold tire setter that is also a comfort and great medicine for "that tired feeling." There are dozens

of kinks that I have caught from THE AMERICAN BLACKSMITH that I use right along in my work.

The following are some of our prices:

Horse shoeing, 4 shoes.....	\$1.00
Tire setting per set.....	2.00
Wagon Tongue.....	3.00
Wagon Tongue, new hounds.....	4.00
Bent Shaft.....	1.50
Covor Bar.....	1.00
Plow Sharpening.....	15 to .60

I am always looking for the journal about ten days before it is due.

#### Modern System of Advertising the Blacksmith Shop.

Modern methods of advertising, as applied to the service of the up-to-date blacksmith shop, contain some features that are surprising to the staid, conservative old-time blacksmith. There was once a certain member of the fraternity, well along in years, who took a younger man into partnership with him. The younger man had

used to fret and one day he approached the old man concerning the project of increasing the business a little. "How

#### THE SHOD HORSE

**Some say the horse is shod.**

**Others, that he is shood.**

**Let us shoe your horse.**

#### THE SHOOD HORSE

ADVERTISEMENT NO. 2.

are you going to do it?" snapped the senior partner. To the horror of the dignified old man the junior partner exhibited copy for advertisement number 1 to be inserted in the local paper. And the name of the firm followed. "What! Advertise? Advertise?" shrieked the old man. "I never advertised, my father never advertised, and we always had plenty to do without asking people to come to the shop. Haven't we been successful?" "Yes," replied the junior partner, "but more success and more business and profits will result if an effort is made for patronage." "No! No!" said the senior partner. "No advertising for me. Foot gearing! Nonsense!" But the senior partner did not mean all he said. He was simply fussy. The junior partner placed the advertisement and the old man saw it,

"foot-gearing" of their horses cared for. This was evidence that they had noticed the oddly worded advertisement. This encouraged the junior partner and the first day of the next week found him in readiness with advertisement number 2. The old man warmed up at this. "The horse is shood?" he shouted. "O bother, you will bring ridicule upon the shop. Don't sign the firm name. Sign your own." At the same time the old man was amused. Besides, he was a little inclined to love the mighty dollar, and as there had been some increased business resulting from the first notice, the old man made no real objections. During the following week, an occasional patron stopped and exclaimed that he wanted his horse "shood." The merry twinkle in his eye would prove that he had seen the advertisement.

Business had been good right along,

#### SHOE YOUR HORSES!

**When the foot gearing of your horse gives out, come and see us.**

#### DON'T WAIT TOO LONG!

ADVERTISEMENT NO. 1.

worked for the older man some years. The business thrived steadily because of the reputation the shop had for good work. There was always enough work for an additional man besides the partners, and the old gentleman was quite satisfied. However, not long after the younger man had been taken into partnership, he began looking about for opportunities to improve and increase the business. He subscribed for the trade journals and never cast the circulars and catalogues of the manufacturers of modern, labor-saving devices for the shop into the fire. If an agent called, representing a builder of a new design of metal working machine, the junior partner interested himself in the same, while the senior partner growled about new fangled inventions. The latter was always saying, "We have all we can do. Our business is established, and everyone knows we are here." But the junior partner contin-

#### GET YOUR HORSE SHOD!

**How is that set of shoes we put on for you-last fall?**

**Don't take chances with your horse's hoofs.**

#### SHOES WILL WEAR

ADVERTISEMENT NO. 4.

but there were some additional customers being added to the list. In fact, business was increasing, and the junior partner did not have much trouble convincing the old man that it was due to the advertising. When once he got the senior partner to thinking this way, the rest was easy. The next week advertisement number 3 appeared. The old man ground his teeth at this. "What nonsense," and he was about to say something disagreeable when a patron entered with a team of horses. "I want these horses shood."

But the climax came when one day, unbeknown to the senior partner, the junior partner appeared in the shop with some neatly printed show cards. The junior partner had conceived the idea of printing in plain type on large white bristol board the notices as they appeared from week to week in the press. "What, turn this shop into a picture gallery?" said the senior partner.

#### THE SHOE AND NAIL

**For want of a horse shoe nail, a battle was lost.**

**We have plenty of nails.**

#### CLINCH YOUR NAILS

ADVERTISEMENT NO. 3.

but said nothing. During the course of the week, several farmers and others who had never patronized the shop before, stopped and asked to have the

"Never! Never! A show window for a blacksmith shop? We don't sell collars and neckties." But the junior partner continued to paint his signs and place them in the front window of the shop. The letters were large and plain. Busy people stopped long enough to read the weekly comical and pointed announcements. The thing finally got to be the talk of the town. But the practical results were what the smiths watched for. The shop was getting to be better known outside its own district. People in the neighborhood had always known the shop. But the farmers, the manufacturers and the people in general outside the territory never had heard of S. and R.'s horseshoeing and blacksmithing establishment until they read the newspaper advertisements, or passed the shop and observed the signs. These advertisements and signs served to keep the name of the firm always before the people and those who could not remember the name could readily remember "the shop that did the funny advertising." And when they sent their men to town with the shoeless horses or the broken wagon they did not forget the firm that advertised.

According to latest accounts, the junior partner is the winner. The old man growls terribly to himself, but lets his junior partner have his way. Another sign and press copy produced by this odd young man is reproduced in advertisement number 4.

#### A Canadian Shop For General Work.

H. E. PLAYLE.

The engravings shown herewith are of my shop, which is 75 feet long by 22 feet wide. I have installed power this year, a 2½ horse-power Weber Junior engine, which is hard to beat, and also have a Little Giant trip hammer, a drilling machine, an emery wheel and a large blower which runs my three fires. These are run by the engine all at the same time, leaving plenty of power to spare. Now I am putting in a circular rip saw to cut up my hardwood. I run a general blacksmithing and woodwork shop, and make anything that comes along. Work is a pleasure when you have the tools to do it with. I studied a long time to see if it would pay to put in power, and by the aid of your paper I thought I would try it. I can assure

you I would never go back to the old way again. I have made quite a few hand and foot machines, but they are not to be compared with power machines. It pays to keep up with the times and a man is better able to meet competition when he has up-to-date tools. I have a registered farrier and shoeing smith working for me, but I attend to the general work and machinery myself, for I like that best. I am well pleased with your paper and look forward to it every month. A man is never through learning, and I very often pick up new ideas. I wish you could publish the paper twice a month, even if it would cost more. I save all the papers and bind them, and then when I have any spare time I can study them, because they always seem new. The articles are always interesting to the ambitious smith and save him both time and money. A complete file of *The American Blacksmith* makes an excellent book of reference and contains matter that cannot be found in any other book.

#### Striping Pigments. Methods of Mixing and Using. M. C. HILLOCK.

The condition and the methods of mixing the colors play an important part in the art of striping and ornamental work in general. It is one thing to be able to draw accurate and uniform lines, or to execute fancy "cut up striping," scrolls etc. and distinctly another undertaking to mix the pigments to be employed for such purposes so that the best results may be obtained. As a rule, painters meet with more or less difficulty—and this refers with especial emphasis to the small shop workmen—in using tube colors which, while being ground sufficiently fine, are very often

enough to work from a palette knife, to break into drops and short, stringy bits of color. To work properly for a striping color, the pigment should flow, when thinned sufficiently, in a smooth, unbroken stream from the palette knife. When it works thus freely and smoothly from the knife or paddle you may be sure that it will work equally smooth and uniform from the point of the striping pencil. Such colors may be manipulated as follows to correct the "short" propensity:—From the tube squeeze sufficient pigment to stripe the job in hand. If ground in japan, as most tube colors may be obtained at the present time, add a few drops of finishing varnish, and a dash of turpentine to liquefy the pigment to at least a stiff paste. Then take a small portion of the mixture, and with turpentine further reduce the material until it will flow from the knife blade to show whether it works "short" or the reverse. If the pigment is ground in oil, as some kinds usually are, beat a few drops of coach japan into a small quantity of the material, and then, as above advised, add a little varnish, and test for "shortness." In case the pigment continues short add more varnish until the defect is eliminated. Varnish, and, in fact, all liquid mediums, should be added little by little until the desired condition of the mixture is obtained.

The colors which are classed as "short" working colors are flake and Chremnitz white, Florence white, (which is merely a commercial name for zinc white), ivory and other carriage blacks, yellows of the light type in which white is the predominating pigment, and some of the reds of modern origin. All the white pigments may be improved in their working quality by treating as above, and by the addition of a very small quantity of drop black mixed intimately with the white. The best method of adding one pigment to another for striping purposes, in order to insure thorough incorporation of ingredients, is to lift the desired quantity of the principal pigment onto the mixing slab, and then with the palette knife rubbing the shading, or tinting pigment, as the case may be, completely and carefully into the mass, after which further liquefying mediums may be added as required.

Caution should be exercised in employing japan to hasten the drying of striping colors. Some colors, it will be understood, are natural dryers in themselves—that is to say, they possess the essential drying power which other



INTERIOR OF A CANADIAN GENERAL SHOP.

"short," if mixed in the ordinary way. The word "short," as applied to a striping pigment, describes a condition which causes the material, when thinned

colors possess only after the incorporation of a certain quality of japan—while other colors are notoriously non-drying. A nice balance of discrimination is required to get the right drying property without undermining the durability of the pigment.

Gold bronze has for many years been largely used as a carriage striping material for at least the medium priced carriages. Especially in the country, and among country vehicle owners and users, the gold bronze stripe, with its burnish and its real touch of elegance, remains an undisputed favorite. Mix the bronze in, say  $\frac{3}{4}$  pale drying japan and  $\frac{1}{4}$  finishing varnish, and use turpentine as a pencil dipping medium. To the bronze, add a few drops of flake white, mixing thoroughly, to better the working property of the bronze, and to prevent the laps, where a freshly filled pencil is laid upon the point of the stripe from which the empty pencil was lifted from showing. This practice will develop improved working properties, and a finer and more uniform appearance. In using gold bronze the novice or inexperienced striper will meet with what in trade language is called the "verdigris problem." This may be overcome by mixing the bronze first in benzine, or even turpentine, and standing the mixture aside over night. This verdigris or "brassy" matter will wash out and float on top of the thinning fluid, from whence it may be poured off, after which mixing of the bronze may be proceeded with. Thus treated the bronze yields a fine, rich, and durable metal lustre. A great difference in gold bronze powders is to be remarked, and it is today possible to obtain a real gold bronze, and not merely the shadow and substance of it. Proportionately, of course, the price will be higher with a corresponding higher quality of results to be obtained.

One particular advantage to be noted of gold bronze for ornamental purposes is its universal usefulness—its adaptability for all colors and all surfaces. Gold is never below par even upon the family carriage, and a skilfully laid stripe or ornament of gold bronze harmonizes with every and all colors, and looks every inch the distinguished material that it is. Upon some colors, as, for example, light yellows, creams, and many of the lighter reds, aluminum bronze, and leaf, yield immensely pleasing results. Naturally, better effects are to be had from using the leaf than from the use of the powder. Mix the aluminum bronze powder in quite the

same way that we have advised mixing the gold bronze except that the aluminum need not be submerged in, or washed out with, benzine or other volatile fluid. No other material apart from the customary thinning liquids need be added to the aluminum bronze as the verdigris propensity is not present in this material. For lettering purposes, and, indeed, for all ornamental work of importance, we would urge the use of aluminum leaf. It will insure richer and more permanent effects, to say the least. Much depends, it will be granted, upon the size used for the leaf, and the manner of applying the size. For a comparatively quick size such as the carriage



A CORNER OF THE MACHINE SECTION.

painter is often compelled to use, employ a medium quick drying finishing varnish, using turpentine sparingly as a dipper for the pencil. The difficulty of thinning the varnish out much with turpentine is that the size on the edges of the stripe dry out, or have a tendency to dry out, before the center is in a condition to receive the leaf, with a ragged edged stripe or ornament as the result. If time will permit, use 3 parts, of fat oil, 1 part finishing varnish, and 1 part gold size japan, for a size that under ordinary drying conditions will hold a good leafing "tack" for at least 10 hours. Aluminum leaf, on account of its greater thickness and coarseness of texture, will not lay securely over a size to which gold leaf will permanently adhere. In other words, the size for gold leaf may be allowed, and by experts is allowed, to dry until the "tack" is scarcely perceptible, and the burnish of the leaf

when laid is all the brighter for the delay in putting on the leaf. Aluminum leaf, for the reasons already stated, would not hold fast to such a size. At the same time, this leaf, in common with gold leaf, is very susceptible to the effect of a size too wet at the time of applying the leaf. Applied at such a time the leaf acts in the nature of a blanket, effectually stopping further drying of the size, which in turn causes the size to penetrate and work out gradually through the leaf, causing discoloration, and blackening, and loss of burnish, of the metal. An over thick size, or the application of too much size, which amounts to the same thing, will produce similar results. The size that develops the best possible burnish for both gold leaf and aluminum leaf, is a fine brand of fat, raw linseed oil applied without any thinning or drying medium added to it. Admittedly, a size of this kind demands fully 24 hours, and under some adverse drying conditions, 48 hours or more, to dry out to a "tack" just right to hold gold leaf. About 24 hours will suffice for aluminum leaf. If aluminum leaf must be laid, say, an hour after applying the size, use 3 parts finishing varnish and 1 part gold size japan, and draw the lines out comparatively thin with the liquid.

For a fine, cool effect on white, cream and light yellow surfaces, blue lines drawn with exceeding accuracy are now popular, and chief of all these blue line effects is the deep chrome green stripe glazed with ultramarine blue, medium shade. Lines of black, or of brown made of Indian red and black, when glazed with any one of the three shades of ultramarine blue, give charming striping effects upon the colors previously mentioned. Mix the blue for glazing purposes in a pale, elastic finishing varnish, thus maintaining the original purity of the color. This rule applies with equal force to the use of carmine, the lakes and, for that matter, to the use of all transparent glazing colors. For black and the ever popular green surfaces, lines of primrose yellow, Naples yellow, canary yellow, sulphur yellow, cream color, etc., glazed with No. 40 carmine continue to be prime favorites both in town and country.

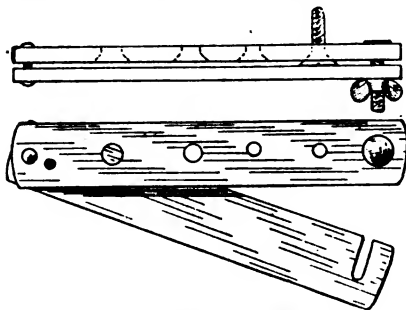
#### A Handy Device for the Plow Repair Man.

M. KEPPLINGER.

The nut on a cultivator or plow share bolt often turns very hard. The thread being good we of course cannot throw the nut away, we therefore grease it and attempt to turn it on the bolt.



But if we put the nut in the vise the edges of the nut will be pressed together and the neck of the bolt is too short and the jaws of the vise too thick to allow for putting the bolt in the vise. Therefore we make a tool as shown in the engraving. Take two pieces of steel



A HANDY DEVICE FOR THE REPAIR MAN.

1½ inches wide, ⅜ of an inch thick and ten inches long and drill holes in these pieces as shown in the engraving. The holes are to be of a size to admit any bolt which you are likely to handle. Now slightly countersink the holes which are to hold the bolts. Then rivet the pieces together in such a manner as to have the countersunk side of the one piece on the inside. Fit the end opposite to the riveted end with a thumb screw and bolt. The device is now ready for use. A bolt is now placed in a hole of the proper size, the thumb screw tightened up and the holder placed in the vise. The nut may now be run on and off with ease.

### Threequarter Shoes as a Remedy For Interfering.

E. W. FERRIN.

I have been recently working on a typical case of interfering behind. The subject in this case is a fine bay mare, a well-bred roadster with just one defect, she is "cow-hocked" behind, see Fig. 1. This was a chronic case; she had been wearing boots for years. I had this mare going clear about a year ago, shod with a thin inside anti-interfering shoe, but this spring the mare changed hands, and the new owner doing a great deal more driving, she began to interfere badly when the hot weather set in.

Now the average "cow-hocked" horse strikes with the heel of the hoof, but this one strikes with the inside toe; and this peculiarity somewhat upset my calculations. I had tried several methods of shoeing, without success, when one of my men suggested a three-quarter shoe, but since this animal strikes with the toe, not with the heel, I could not see how a three-quarter shoe would prevent the trouble, but I thought I would give it a trial just as an experiment, so I took some ⅜ by ⅜ steel and

forged a pair of threequarter shoes, tapering the inside away to nothing, see Fig. 2. I fitted these to the foot, rounding the edge of the hoof not covered with the shoe, so as to leave a strong edge that would not chip. This proved very successful and the mare has not interfered since.

This is one more case which proves the exception to the general rule. This goes to show that any case of interfering may present individual peculiarities that need special treatment. The shoe in this case is very light, and nearly all the weight is on the outside and while most of the weight being on the outside may have had something to do with the cure in this case, it does not follow by any means that it will be effectual in the next, for many horses are cured of interfering by the use of inside weights. In this case, the inside of the hoof not covered with the shoe grows up tough and strong and level



Fig. 1.—SHOWING COW-HOCKED CONFORMATION.

with the shoe, and the inside of the hoof is now wider than when it was shod with a full shoe, yet the animal goes perfectly clear at all times.

### Shoeing a Horse as He Should Be Shod.

DANIEL FERRON.

The first thing to do when the horse comes into the shop is to observe the formation of the limbs from in front, behind and sidewise, taking particular notice whether he toes out or in and whether he tilts back on his heels or has a long high heel and a straight up and down hoof. After a careful examination of limbs and feet, see that the outer wall of the foot is perfectly clean. Next raise the foot and see how the shoe is worn. Now carefully cut the clinches

and with pulling pincers well under the shoe, take outside heel first, then inside heel. After loosening the shoe at both sides, draw the nails, so the pulling

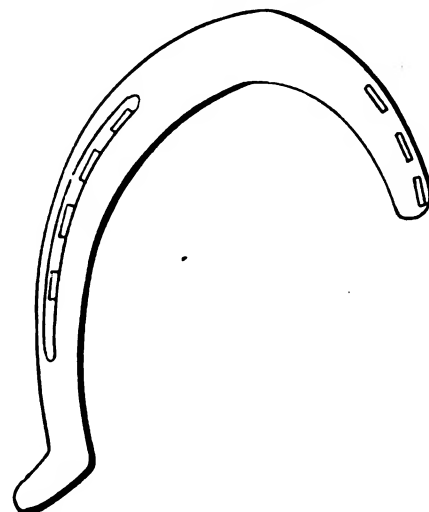


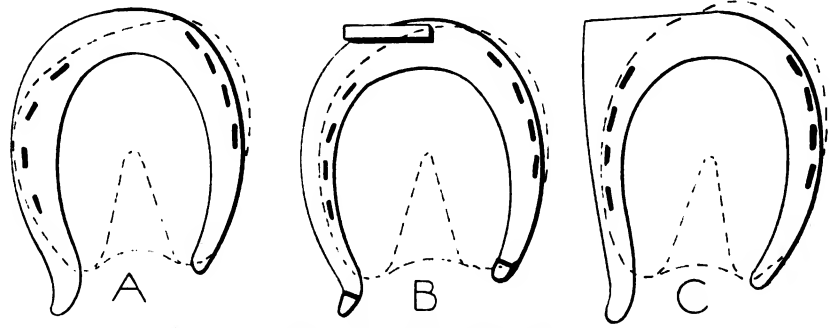
Fig. 2.—SHOWING A THREE-QUARTER ANTI-INTERFERING SHOE.

pincers will not injure the sole of the foot. Many feet are ruined by bad methods of pulling shoes. Some men jerk and tug at the shoe without ever cutting the clinches, thus bruising the sole of the foot and tearing the wall. The shoe being removed, the most difficult job now comes, i. e., to know how to pare the foot properly. This is one of the great secrets of proper shoeing. You have taken note of the formation of the limbs and the tilt of the foot, so if your horse rocks out, pare down the inside, then let the foot down on the floor and see if it stands level. If not, pare the rest when fitting the shoe. Be sure to get the foot level so there is no space at the quarters between the shoe and the foot. Fit the shoe to the foot by having the shoe come to the outside of wall all around. If the shoe has a toe-clip, heat the clip slightly so as to burn a little at the toe. This will mark the place to cut out for the clip. I don't believe in too large a clip, nor in burning the horse's hoof, but the shoe may be heated a little when about to fit so it is hot enough to sear the hoof a little. You can then tell whether the foot is perfectly level or not. If not, remove the high spot with a rasp and by no means let the shoe bear heavy on the heels. Be careful in selecting the size of the nails so they will not crack or split the wall. Also, be particular in driving nails. Get them of a uniform length. After you have driven all nails, strike each a blow so it fits into the crease, then take the clinch block and draw the nails carefully. Do not hit too hard and never draw too hard on the outside heels. Now nip the nails off

quite short. It is not necessary to have a long clinch and in a good solid foot it is not necessary to clinch at all. After the nails are clipped off, take the fine side of the rasp and remove the little burr which is raised out under the nail. Be careful not to let the edge of the rasp cut a furrow all the way around the hoof. A little just under the nail, so the nail will clinch down nice and smooth, is all that is required. In clinching don't strike the hoof too hard, but strike the nail so it will turn over easily. When done clinching, take the rasp and smooth down the clinches. As your shoe is fitted out flush to the wall, it will need little rasping. The wall is better if never touched with the rasp on the outside. If the enamel could be left on it would be better for the foot. Now, all being done, let the foot down and see if you haven't improved the way he stood before you shod him. If he does not stand perfectly square, make up your mind that the next time you shoe the horse you will have him standing square.

Mr. Horseshoer, remember when you are working on a horse's foot, you are working on something that has life in it. The horse's foot is a very sensitive thing, so be careful not to strike it too hard. I have seen smiths strike a poor horse on the wall to drive a shoe back to place and hurt the horse very badly. You must remember you are not working on a block of wood. Read this carefully. Some will say this is old. I know it is old, but it will bear repeating and should be put into practice more than it is. My reason for writing this article is, I have seen the horse's foot so much abused that at times I had have to turn my head. Some fellows pound the foot, draw down a half-fitted shoe on a half-pared foot with neither shoe nor foot level. But the shoe is spiked on just the same. Still these men are allowed to shoe horses and cut prices. It is time this matter was looked into and a strong attempt made to protect the poor dumb beast from being tortured by unskilled men. Some say it can't be done, but I say it *can* be done and the American Association at Buffalo has started the ball rolling. Their plans are good and they have the best journal in the United States for their purpose. All they ask is, that every smith of every State in the Union send his name to the Legislature saying that we want an examination law passed. This will compel every smith in the United States to take an examination before he can practice the art of

horseshoeing, and every young man will have to work under instructions until he becomes a skilled workman. This will do away with all price-cutting and hard feelings. Our craft is in the worse condition of any trade on the face of the earth today. A trade that should stand above all others. Young man, it will be the best trade on earth, if you only take an interest in it. Each and every man, take hold and write a letter to this paper telling that you are in for such a move with heart and soul.



HOW TO SHOE THE KNEE-HITTER.

It lies in your hands to make good. Keep things stirred up. It will be but a short time before the old smiths drop out and then there will be a panic for horseshoers. So I say, young men, start now, learn the trade and take hold of it in time. Put your shoulder to the wheel and push with all your might for legislation. There are few who know as well as I the bad state our craft is in. I have traveled considerably where everything should be flourishing and all I find is contention and price-cutting. A state of affairs that should not exist and which can be overcome if you all lend a hand with the American Association of Blacksmiths and Horseshoers. They have spared nothing to put these measures to reform. Don't be afraid to subscribe for the AMERICAN BLACKSMITH. Hand your order to the man they send out or send it in to the company and you will receive the paper promptly. Now as they call on you, don't let the chance pass, but let every smith in the United States subscribe for this paper, and keep up-to-date in all that is going on. We have started out for reform and we can win if we only give our help. It is all for our benefit and it will be the greatest and grandest thing that ever happened for the craft. So while you have a starter and a backer come to the front like solid men.

Don't wait for your neighbor to approach you on this subject. Be the first one to speak about it. You will find your brother craftsmen ready

enough to help you. Write to the association at Buffalo, tell them what you intend doing and you need have no fear of your plans falling through.

#### How to Shoe the Knee-hitter.

A. A. DUBA.

When I get a knee-hitter I try first to find out where the trouble lies—if it is in one or both feet and whether he is perfect in his joints or deformed. If they are perfect I then examine the foot and shoe. Every knee-hitter, you will find, wears the outside toe and web of shoe or

foot, whether he is basewide or narrow. I now decided whether the trouble is in the foot or joints. If it is the foot it is an easier matter and requires less radical treatment. There are many things to observe and the shoer must rely on his judgment and experience. If the foot is long and narrow it should be shortened to the right angle, say 45 or 50 degrees. If the foot is short with very high heels it must be brought to the right angle. Examine the foot to see if it is perfect, that is, if there is the same width of hoof on each side of the frog or if the outside or inside heels are rolled in or contracted. This should guide you in the manner in which to prepare the foot and fit the shoe. Always bear in mind to prepare the foot and fit the shoe in such a manner that the horse will have equal bearings on each side of the foot, that is, make him wear his shoes level, both heels and webs alike. In cases where the foot is nearly perfect and there is plenty of hoof to work on, I use a shoe like A. The dotted lines show the foot before it was prepared. Observe the manner in which the shoe is set at the heels. With part of the frog, more is accomplished in the manner the shoe is set than in the style of the shoe. In severe cases (such as deformed joints), use shoe at B, with calks and use extended toe calk, in length, according to the severity of the case. A very good shoe when you have not enough hoof to work on is shown at C. I always keep the heels as wide as I possibly can as there is less chance to

twist. If you do not succeed the first time do not be discouraged, examine closely and see if you have not gained a little. Sometimes it takes me two or three shoeings to effect a cure. Always use as light a shoe as the horse will travel in, as it decreases his knee action. The most difficult are those that hit the ankle, shin and knee, all at the same time. If you make them break off too much on the inside, they will clear the knee and hit the ankle. If they break too much on the outside toe, they will clear the ankle and hit the knee. In these cases I compromise. I use a square toed shoe with good success. My theory in gaiting horses is to prepare the foot and set the shoe (and style of shoe for each purpose) in such a manner that the foot will be carried in the direction he breaks, regardless of weights.



Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

The following formula is a very good one for a hard putty to be used on carriage work, says a veteran painter. Mix equal parts of dry and keg white lead with equal parts of rubbing varnish and gold size japan; mix thoroughly and pound well.

After having considerable trouble with breaking drills, the boss makes a practice of treating all new drills by drawing them to a straw color for about one and a half or two inches at the point where they usually break. This makes them less brittle and less liable to snap off.

A glue that will not mold or sour is made by an Ohio smith as follows: Two ounces of borax and one ounce of calcined potash boiled in one gill of water, until thoroughly dissolved. Now soak one pound of good glue in the usual way and stir the above solution into the glue. Hot water is now added to the whole until the glue is of the proper consistency.

A peculiar job at the shop the other day necessitated cementing a piece of leather to an iron slab. The boss did the trick in the following manner: He made a mixture of white lead and lamp black, dissolved in oil, and painted the iron with this. He then soaked some glue as usual, until soft, and dissolved it in vinegar. To this glue he added one-third its bulk of turpentine. The whole was then thoroughly mixed and

thinned with vinegar until of a consistency to spread easily with a brush. This cement was then applied to the iron while hot, the leather quickly pressed into place and then firmly clamped until the cement was thoroughly dry.



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**Rubber Bushing in Springs.**—I have read two numbers of THE AMERICAN BLACKSMITH and I like it very much. I would like to ask a question. Which is the best way to put rubber bushing in open head springs? OTTO GUNNALD.

**Wants Some Bolt Dies.**—I would like to get diagrams of some bolt dies. I have a bolt machine but the dies do not finish the bolts as fast as I would like to have them. It takes four strokes of the machine to make one bolt. Can some brother smith tell me what kind to use? E. V. REED.

**An Interfering Horse.**—We have a horse that is interfering in front. He is about ten years old and never interfered until this spring. He is not bad, but hits himself four of five times a day. Would like information on the shoeing of the animal by some one who knows. S. J. PERMAERTON.

**About Crawling Varnish.**—In reply to H. H., in the June number, about varnish crawling, his trouble comes largely from using too much raw oil as a binder. If he will use Benjamin Moore & Co.'s New York superfine drop black, he will get satisfactory results. J. W. JOHNSON.

**A Colt with Ring Bone.**—I have a black, high bred, two-year-old colt that has two ring bones on the hind feet. Can these be killed and the bunches removed without leaving a scar? I have always killed ring bones with a sweating liniment called "George O. Hurland's," but this makes a bad sore and leaves a scar. Can any brother suggest a remedy? F. S. EVANS.

**Removing Old Paint.**—Will some brother smith tell me a good and easy method to remove old paint from carriages, or anything that requires it, where it is scratched and requires scraping? I do some painting and find the cleaning the biggest part of the job. Let me hear plenty of free talk on the subject. H. HUSSER.

**That Gaff Hook.**—In answer to Wm. H. Respass' query how to forge a gaff hook in the solid. Take a piece of  $\frac{3}{4}$ -inch stock, upset one end and drill or punch a hole here. Then forge the end flat by hammering around the punch. When you have the ring size wanted cut the stock off three inches from ring and draw out the hook. You will then have a gaff hook with a solid band. C. B. B.

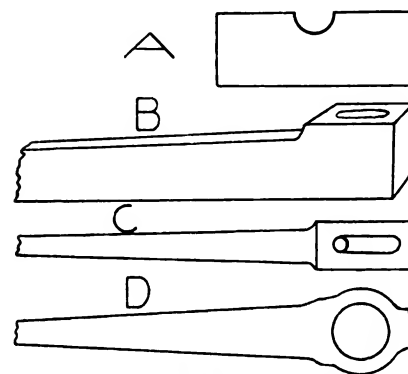
**The First of the Season.**—During the cold weather last winter I let the water freeze

in my gasoline engine, thus bursting the jacket quite badly. Will some one tell me how to fix it? It is a Webster vertical engine. Can I braze it? If so what kind of torch must I use, how shall I prepare the brass and what kind of flux will be necessary? It cannot be banded or clamped together as other parts of the engine are in the way. WALTER MCCOY.

**A Horse with Bad Feet.**—I have a horse with very bad feet. He is a western horse, 8 years old and weighs 1,500 pounds. The crust of his foot from the quarter to the heel is very thin. His heels don't appear to grow down any, but his toes grow very fast and when his toes grow down they cause the shoe to rest too much on the heels and then he goes lame. He used to have quarter cracks, but I have got them to grow down all right and no cracks are to be seen now. His frogs are very soft and are too much of the beefy nature. I have shod him with a leather sole between the shoe and the foot, but at the end of three weeks his shoes must be set or he will be lame. F. S.

**A Few Pointers on Horseshoeing.**—I received THE AMERICAN BLACKSMITH and would not be without it. I learned my trade with a first class man, a good horseshoer, and I follow his way as well as I can. I am very successful in shoeing, and try to fit the foot as close as I can. The front foot is round and I try to keep it that way as near as I can. Some of the people I work for think I fit too narrow at the heel. The trouble is the rest of the smiths fit the foot to the shoe. The hind foot of the horse is not the same as the front foot. It is nearly straight on the inside and round on the outside. I always drive my nails high and have no trouble in doing so. I would like to hear personally from a first class horseshoer. J. A. STEWART.

**How to Forge the Gaff Hook.**—In reply to the gaff hook query I send my way of forging solid eyes. Take a bar of steel or very good iron about as wide as you want your eye. Then swage as shown at A in the engraving. Now take a flat punch with round edges so as not to make a cold shut



HOW TO FORGE THE GAFF HOOK.

and punch hole, as shown at B. Now take a small round punch and start it in the flat hole next to the inside, as shown at C, and forge the band. You will then have an eye, as at D. Work it on the horn of your anvil or on a mandrel. To finish the outside flatten with a round edge. A fuller the right size and a mandrel to fit inside will make a good job. A. A. HOWARD.

**Forging the Gaff Hook.**—Answering the query of Mr. Wm. H. Respass, I will give the following method in which I would do the job. I would first fuller my stock on three sides, allowing room on the end to punch a hole and still have enough stock for the drawing of the band. Then I would

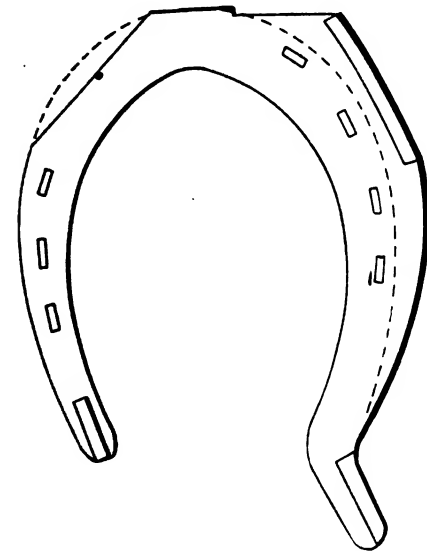
cut it off and forge the other end, which would be the hook. This tool should be made from mild steel so as to prevent it from splitting when expanding it. You can calculate the amount of material by multiplying the diameter  $1\frac{1}{2}$  inches by  $3\frac{1}{4}$  or 4 5-7 inches and multiplying this product by the width of the band which is not specified. The amount of material for the hook is very easily found. You can guess at that part and if it is too long you can cut off.

WILLIAM HERMAN NORRIS.

**Forging Rings from the Solid.**—The paper of July contained an article, "The Forging of Collars and Bands from the Solid," by C. H. Richardson. I thought this was very good for large collars or bands, but often we have small ones to make, say two inches in diameter of  $\frac{3}{4}$ -inch stock by two inches long. The firm thought better to make them out of the solid than to trust to a weld and so do I, especially when made of steel. I would like to ask Mr. Richardson, through your valuable paper, how he figures out the stock for small collars where the thickness of the collar comes in fractions of an inch. I would also like to know what the rule is to make a band this way: Take a piece of 6 by 2-inch stock, heat it and split out so it will make a band 8 inches in diameter. How long must the split be? Very often we have to make bands this way. It is good practice, but when you have to guess how long to split between points it makes it troublesome. I thought I would mention this while under the subject of bands and collars. I would be pleased to hear about this as it will be of value to all.

JOHN WYMOND.

**How to Shoe a Horse that Cross Fires.**—In the July number, we read of a brother blacksmith wanting to know how to shoe a horse that cross fires. We have a big pacer here by the name of Jim Tate. He cross fired so badly that he would cut his



HOW TO SHOE A HORSE THAT CROSS FIRES.

quarters all up. He is now in the hands of one of the best veterinarians in the state and does a mile in 2.15 and never touches himself. The accompanying drawing shows the shoe and we will say to our brother blacksmith that if he tries this shoe he will get good results. Make the horse break over on the inside toe and he will have no trouble. We would like to hear from the brother smith after he tries this shoe.

BUSHHAUSEN AND MARTIN.

**A Number of Questions.**—I shoe quite a number of horses with tender feet and would like to know where I can get some good liniment or hoof grower, also the best

place to get good cheap pads in small quantities. There has never been a pad used in this vicinity and I would like to try them. Where can I get an axle box fitting machine for buggies? I would also like to be informed where to get the best timber wheels at lowest prices in small quantities.

I have a mare to shoe that has a crooked ankle. In front her foot is twisted in, so that it throws all the weight on the outside wall, which has been cut with a wire at the quarter where the weight rests most. I had it so that it grew out solid at one time, but now it is getting worse, but it is not yet cracked to the hair. Would be glad to have some brother smith tell me the best method of shoeing to get the pressure off so it may grow out solid. Also what is the best method of curing stumbling in the hind feet.

W. C. ROBINSON.

**A Shoe for Contracted Feet.**—The accompanying engraving shows a shoe of my own design for curing contraction. The fins at A are drawn out with the pene of the hammer and are intended to fit close along the frog, not touching it but resting upon the braces thereby giving a natural bearing. For contraction they should always be turned upwards for even  $\frac{1}{4}$  of an inch or more. Of course the smith will know that the bars are to be cut just low enough for the shoe to rest on the wall, if there is any, and the fin on the brace. If the shoe is wanted for broken or light walls just use straight fins. I use this shoe with the best of success instead of bar shoes and I know that the idea will appeal to the good reason of the craft because it does away with the continued pressure of an iron surface upon the frog, thus allowing the braces to catch the weight upon them as nature intended. The shoe can be used with or without calks, as desired.

FREMONT KELLEY.

**To the Readers of The American Blacksmith.**—I have been a reader of the paper for over three years, and would like to hear a word from the brothers of West Virginia. I am a blacksmith of thirty years' experience both in horseshoeing and in custom work. I make it my daily business.

In regard to the paper, the first copy saw I signed for it and would not do without it. It's up to the patrons of the paper to make it a success. Write of what you have learned and what you know. It will do me good and I think we can all be benefited by reading of what some one else has gone through. What little I know I have learned (the most of it) from some one else. A few things I have learned by accident and a great many by experience. I have been working for the Fairmont Coal Company for twelve years. The work consists of horse and mule shoeing, repairing electrical mining machines and machinery of all kinds. One thing in particular I have learned is that the man of ideas is the man who is wanted in the industrial world today. Yours for the craft and for the paper.

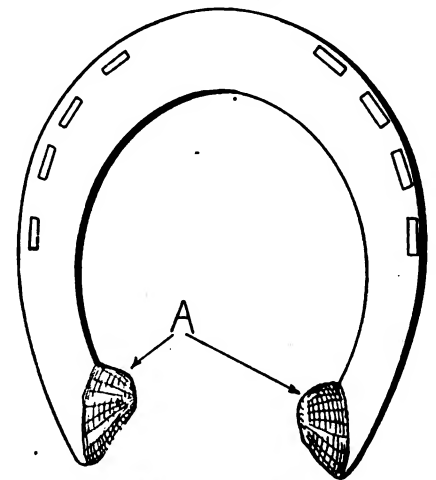
J. L. FORTNEY.

**Making a Z Drill.**—Inasmuch as Mr. H. H. Messingill does not state the facilities at his disposal for steeling a 6-inch Z drill bit, I take it for granted that he is a general smith or has perhaps a small machine shop. For that reason I would not advise him to undertake the job in his own shop, but to send the bit to either The F. C. Austin Mfg. Co. of Chicago, Ill., The Crown Drilling Machine Co. of Akron, Ohio, or The Keystone Driller Co. of Beaver Falls, Pa. These concerns make a specialty of this kind of work and carry in stock the proper shapes and grades of steel and can do a better job for less money than either he or I can. The F. C. Austin Co. and Morgan Kelly and Tarreyhill Co. of Waterloo, Iowa, still make Z tools. But in

this country where we have really hard drilling to do, such bits have long since been changed or thrown on the scrap pile because any man here who has a fairly good rig can drill faster and do better work with the regular fluted club bits such as are in use all over the oil fields. Any of the parties above referred to will quote prices on the job for any weight of steel desired. It will not pay to put on less than 70 or 80 pounds of steel for the 6-inch Z bit. If he wants to tackle the job he can get the scarfed steel ready to weld from the Keystone Driller Co. for 20 or 25 cents per pound.

L. R. SWARTZ.

**Some Practical Matter from a California Smith.**—My methods may not differ materially from others of the craft, but there is one thing I try to do which every up-to-date craftsman should do and that is, I always make it a point to get all the different kind of tools that are in the market,



A SHOE FOR CONTRACTED FEET.

besides making some myself. For example, in shoeing tools I have a hoof spreader for contracted feet, clinching tongs and a tool to cut out the sole of horses' feet. This tool is one of the handiest in my set. It is made like a carpenter's foot adze only very much smaller. It is done easier and neater than by using a farrier's knife. This tool also exposes corns if there are any and is invaluable in these hot, dry summers. Of course I use hoof cutters and the rasp to remove the rim of the foot. I advise all members, especially the younger ones, to always have on hand the more modern tools, for everyone needs them at all times if they wish to do good work.

I saw in one number of THE AMERICAN BLACKSMITH some brother wanting to know how to temper dies. This depends on the grade of steel used. I usually heat dies a cherry red, plunge in cold water; high grade steel dull red, low grade lighter red.

In your July number Brother W. H. C. desired to learn how to cure cross-firing in a fast mare, and says he would like to have the question discussed. I would like to know if there is any different or better method than I use. My remedy is a twelve-ounce shoe with toe and heavy heel in front and light toe on hind foot with heels just as long as possible. GEO. F. WHERRY.

**Replying to a Criticism.**—I am very thankful to Brother Craig for his criticism on my article in the March number. I am afraid the brother accuses me of trying to do away with the tire wheel. His explanation seems a little ambiguous when he says there are two heats to guess at in my method and only one in the old, when from my standpoint it's just the reverse. It was not my purpose to tell the craft how much draft to give a tire, nor how much to



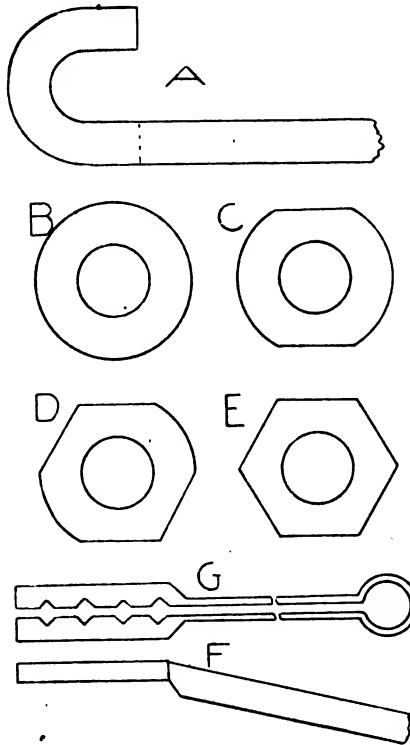
allow for the heat that may be in the tire when measuring it, as both must be learned by experience. Now I want Brother Craig and all interested to pay attention. I never measure a tire when it is hot, as it is neither convenient nor correct to do so. I measure the tire when cold and I care not how much you heat it; if you do nothing else to it, when cold it will be the same size as it was when measured. So it necessarily follows that all the heat we have to contend with or guess at is between the points of the compass or dividers, as that is the only point at which the tire has been changed since it was properly measured. Doesn't that bring the guess work to a minimum, or would you rather trust a measurement taken with the traveler when the tire is hot all around? You know the helper sometimes burns his fingers trying to hold the tire up while you run your traveler on it and you get a little hot yourself sometimes when it doesn't come out twice the same. Brother Craig, the trick is old, but I find it is not so generally used as it should be. My boss used it in 1853 and convinced me of its merits. L. VAN DORIN.

**A Word from North Carolina.**—I have been taking your paper ever since February last. I like it O. K. and get some good things out of it. I run a country repair shop and have been working at the trade twenty years. I do all kinds of work; repairing, painting buggies and wagons—horseshoeing, repair guns and revolvers, make keys and in fact do about everything including the making and repairing of finger rings. I also run a small farm to fall back on as this is a poor country and prices are low. We have a lot of "Jack Legs," as we call them, who pull prices down, but I get all I can do. We haven't had any loose tires this summer. Where is that brother who repairs Sarven wheels without cutting the rivets? I have had a lot of experience in that line, have seen a good many done and have fixed some myself without cutting a rivet, but have never yet seen a good job done that way. I take the rivets out, clean out the hub of all grease and dirt and fit my spokes properly. Put them in with hot glue, remove my wheel from rest and put in rivets. Clinch up tight and put on rim and tire and give from  $\frac{1}{4}$  to  $\frac{3}{4}$ -inch dish. I get a good job every time. A man came to me some time ago with a pony shod that was tipping very badly. He said she never tipped before. I took off the shoes and trimmed down the toe as much as possible. Then I cut the shoes off at the heels and set them back in the proper place. The animal now travels all right. I have been taking THE AMERICAN BLACKSMITH for but a short time but I already appreciate it and get good things out of it. W. C. ROBINSON.

**Making and Tempering Butcher Knives.**—From time to time I have noticed articles in THE AMERICAN BLACKSMITH describing the process of making and tempering butcher knives. While there are good suggestions in all of the directions, most of them are incomplete and leave one too much at sea as to the writer's meaning. Other processes are so elaborate as to eliminate all profits, if followed. The process to be profitable must be short, simple and reliable. I have had good success making many kinds of knives, and after trying several processes have adopted the following as most satisfactory: Taking it for granted that the smith who undertakes to make knives understands the science of heating and hammering steel, I will only say that both should be done as evenly as possible. When the knife is forged I heat it to a low red and let it cool slowly. (This in case I am to polish it.) When cold, I polish it, taking off all oxide and all ham-

mer marks. For a bath I use fish oil, linseed oil or water. For a thin knife use oil, and for a thicker knife use water. When cooling in oil I heat the blade (in a charcoal fire if possible, if not, in a coke fire) to a bright cherry red, and plunge endwise in the oil, letting it remain until cold. Then polish and draw, in a piece of pipe, to a dark straw color. This drawing process should be done slowly and carefully. When cooling in water I heat to a dull cherry red, and draw to a copper color with a shade of purple. The pipe for drawing the temper should be at least three inches in diameter. The idea of a pipe is to keep the temperature as even as possible. H. CHISHOLM.

**Hexagonal Nuts.**—On page 197 of the July number of THE AMERICAN BLACKSMITH Brother M. Keplinger tells how to make what he calls a six-sided nut. I never tried his way, but I don't think it's correct. I take square stock about the size the hole is to be in the nut, heat and bend one end, as shown at A and then cut off at dotted line, making a piece U shaped. After



MAKING HEXAGONAL NUTS.

scarfing the inner corners, we close the piece up on a mandrel about the size we want the hole, weld and dress it up. It should now look as shown at B. Then flatten two opposite sides as at C, use half of the remaining oval and flatten again when it takes the form shown at D. We flatten the two remaining curved sides and finish. We now have a complete hexagonal nut, as shown at E. Though it may be made of common iron, it will never burst in tapping out as the grain of the iron runs around.

Speaking of tapping out reminds me of another little device I used to keep hung up over the vice bench. I will call it a bolt holder. It's for holding bolts while cutting threads on them. I find it very handy and yet I don't think they are very generally used throughout the country. It takes but a short time to make one. Take two pieces of  $\frac{1}{4}$  or  $\frac{3}{4}$ -inch square iron or steel about 4 inches long, and cut some V shaped notches in one side of each piece. Then thin one end of each piece and weld them, one at each end, onto about three feet of old buggy tire. Then bend as shown at G. It is better to bend a little edgewise close to the square parts so your hand will not

strike it in turning screw plate when placed in vise. A side view of the bolt holder is shown at G and a top view is shown at H. In making hexagonal nuts a swage makes it easy to form them, but with practice they can be made without. L. VAN DORIN.

**Seedy Toe—Power in the Shop.**—I have just been reading the letter in the August number of THE AMERICAN BLACKSMITH from the pen of M. L. Chunn. My treatment of seedy toes is altogether different from his, and although I have a good many cases of that disease to doctor, I have never failed to cure a case. My method of course is first to cut away all the hoof that I can, and then to clean out the hollow in the foot and all the pith as deep as I can. Sometimes this is between two and three inches deep. The next step is to get a wide, thin shoe and make it large enough to cover the whole foot. Then I take jute tow and an equal amount of good greasy beef tallow, and mix the tow and tallow until they will work like putty. Then I take up the foot, clean all the dirt out of it and pack the hollow full of the putty mixture. Do not pack too hard as the foot is very tender after being scraped out clean. Now replace the shoe, making sure that it fits level on the bottom, and is wide enough to cover the hollow, so that the tallow cannot get out nor the dirt get in. I always tell the owner to look at the shoe occasionally and if it gets loose to bring the animal back. I take off the shoe, clean out the hollow and repack it again in about a month by which time the hoof will have absorbed most of the tallow. I cut out all the pith I can every time until the hoof grows out solid to the bottom, which is from three to nine months, according to the depth.

Now I will tell a little about my business which may interest the brethren. I moved here about four years ago from Virginia and put up a shop 16 by 24 feet with a second story for material. The blacksmith shop is 16 by 16 feet. The first year I did not get much work because I was an entire stranger and nobody knew what sort of work I could do. But I turned out several good jobs in the way of repairing buggies and put up several carts and wheels, which advertised my work. The next year I had all the work I could do and had to hire a man to help me. Then work commenced to come in earnest and we could not keep up, so I decided to get an engine. I thought first of buying a second-hand steam engine of about four horse-power, but my brother wanted me to get a gasoline engine. I had never seen one and did not know anything about running one but I got a two horse-power engine from F. M. Watkins and Co., which I think was the most profitable investment that I ever made. Then I added 18 feet to my shop, and put in a 14-inch table saw, and emery wheel stand and a small band saw. With the latter I made a mistake in getting too light a machine. I tried to saw scrolls and brackets, but the wheels were only 20 inches and the saws would constantly break. I could not run a narrower saw than  $\frac{1}{4}$  of an inch with any satisfaction. I could cut wheel felloes and wagon reaches with it, but could not do any nice work with it. So this summer I bought a 32-inch band saw machine. It gives entire satisfaction. I can cut small or large brackets or scrolls of any design, and also cut large stock with it. I sawed a bed for an arched axle out of a piece of seas red oak  $4\frac{1}{2}$  inches thick, in about five minutes.

In conclusion I would say to any of the trade, if you contemplate buying an engine, get a gasoline engine and get plenty of power. Don't buy light machinery, because it won't do the work like a heavy machine. A J. PANTON.

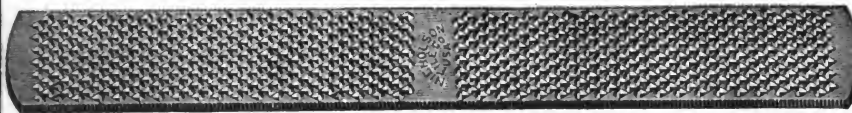
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**Prices Current — Blacksmith Supplies.**

The following quotations are from dealers' stock, Buffalo, N. Y., Sept. 25, 1906, and are subject to change. No variations have taken place since last month's quotations.

All prices, except on the bolts, are per hundred pounds. On bars and flats prices are in bundle lots.

**Bars—Common Iron and Soft Steel.**

$\frac{1}{2}$ in., round or square; Iron, \$2.80; Steel, \$2.90	
$\frac{3}{4}$ in., " " " " 2.40 " 2.50	
$\frac{1}{2}$ in., " " " " 2.20 " 2.30	

**Flats—Bar and Band.**

$\frac{1}{2}$ x 1 in., Iron, \$2.80; Steel, \$2.90	
$\frac{3}{4}$ x $\frac{1}{2}$ in., " 2.20; " 2.30	
$\frac{1}{2}$ x $\frac{1}{2}$ in., " 2.40; " 2.50	

**Norway and Swedish Iron.**

$\frac{1}{2}$ in., round or square, \$4.90	
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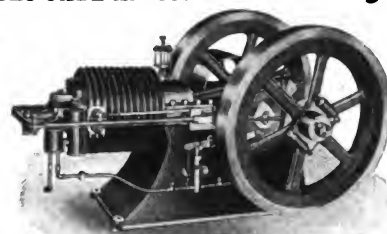
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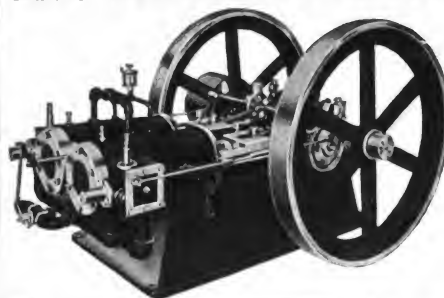
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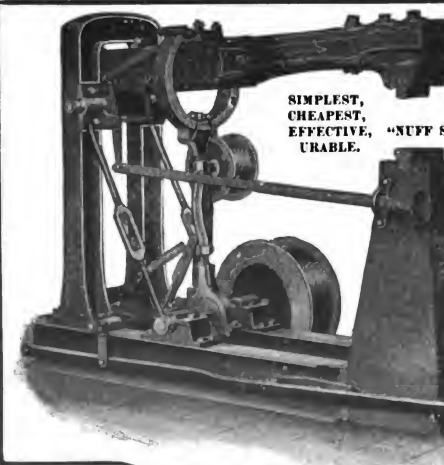
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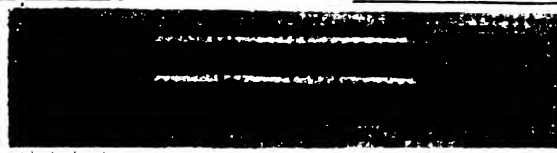
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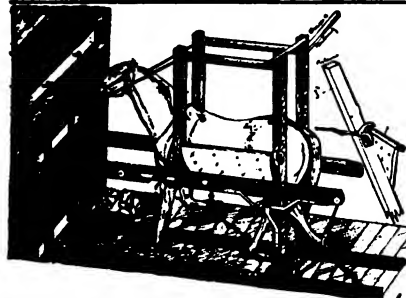
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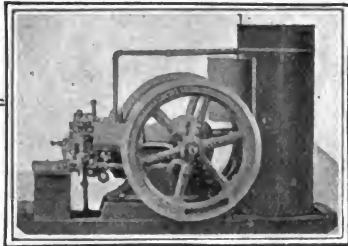
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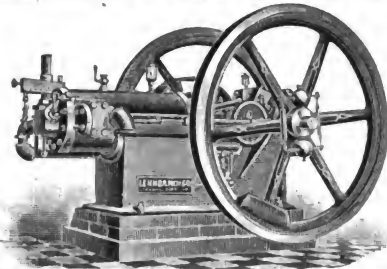
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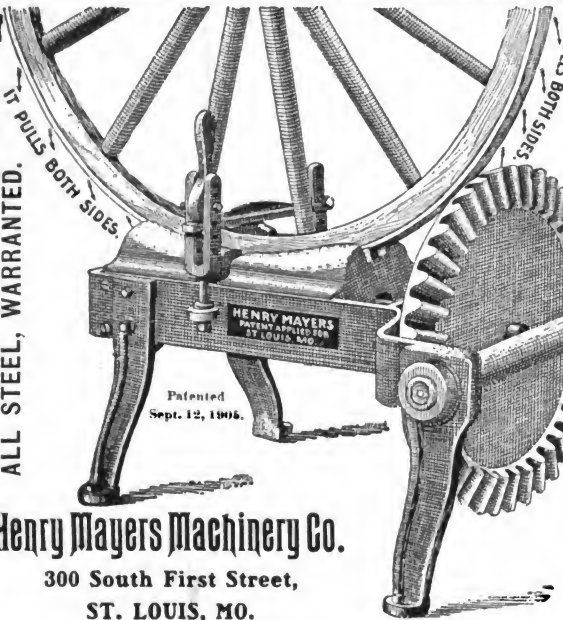
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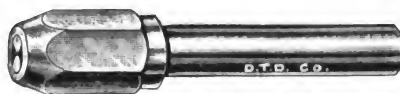
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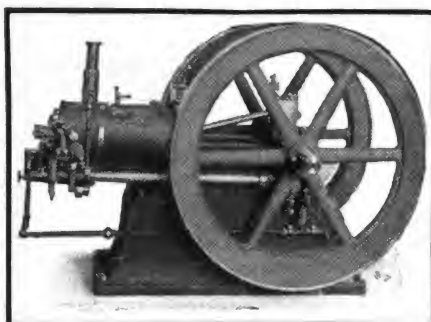


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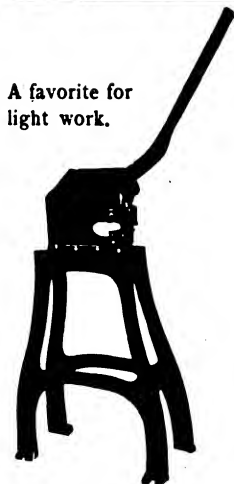
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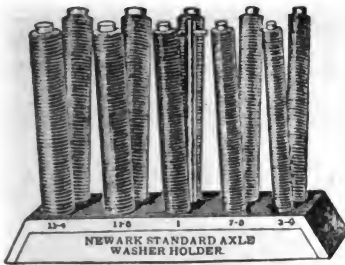
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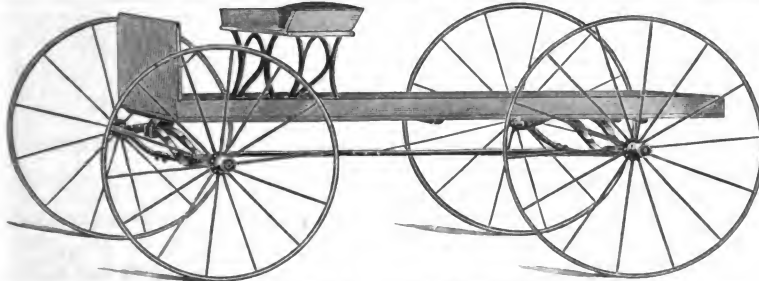
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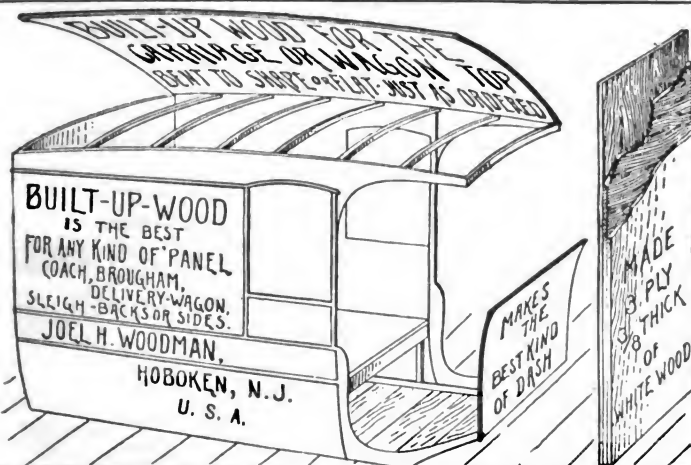
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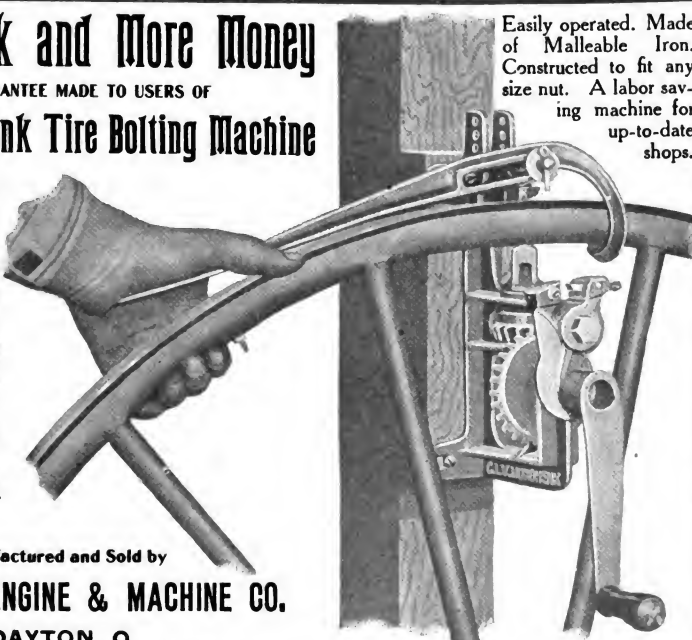
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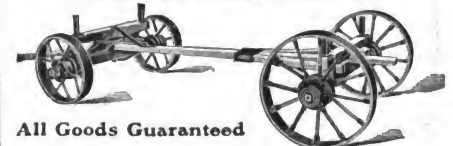
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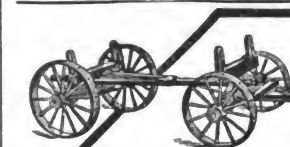
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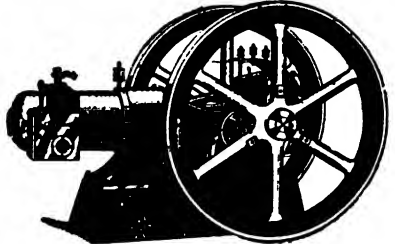
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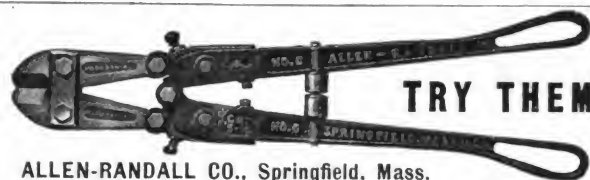
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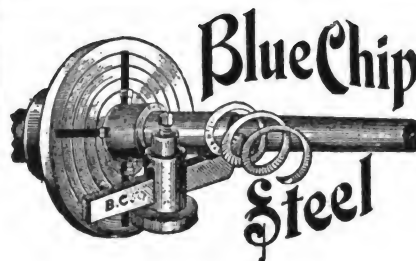
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ALLEN-RANDALL CO., Springfield, Mass.

TRY THEM



Will turn off blue chips  
on any kind of work.

**Firth-Sterling Steel Co.**  
**PITTSBURGH.**

**Selling Agencies:**

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See That Cushion?

It fills with air at each step. That's what breaks concussion. That's what prevents slipping. That's what keeps the foot healthy. That's what cures lameness.

Twelve Different Styles



Heavy  
Leather Back

**NO  
LAMENESS  
NO  
SLIPPING  
CHEAPEST  
AND  
BEST**



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**REVERE RUBBER CO.**

Sole Manufacturers **BOSTON, MASS.**

## AN AXLE

*Which is coming into favor  
again is here illustrated, the*



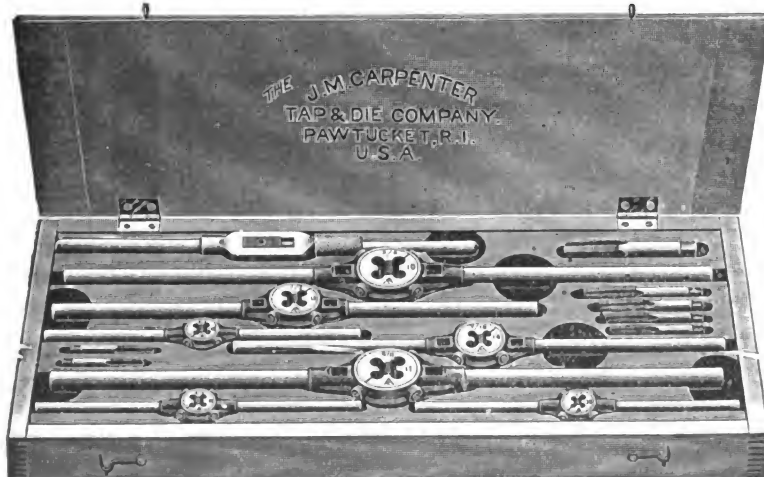
We make it of either iron or steel, fitted with wrought or cast box, and a variety of nuts.

*If you wish further particulars  
Write to the*

**DALZELL AXLE CO.,**

South Egremont, Mass.

**Stivers  
Long Swell**



## CARPENTER'S NEW FULL MOUNTED DIE SETS

With a stock for each die and the Original  
Nichols Tap Wrench.

Before buying a die set you should see  
**Carpenter's** and you will have no other make.

Send for catalogue

**The J. M. Carpenter Tap & Die Co.**

Pawtucket, R. I., U. S. A.

# Suggestions for Wagon Builders

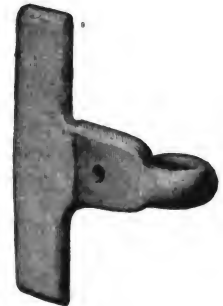


No. 6002  
Wagon Stake Iron

## Use Stock Malleables



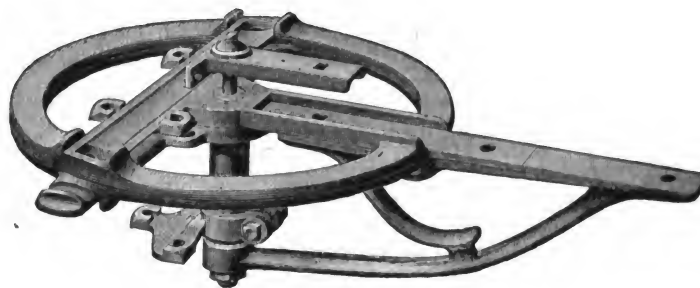
No. 6842  
Farm Wagon Spring Shackle



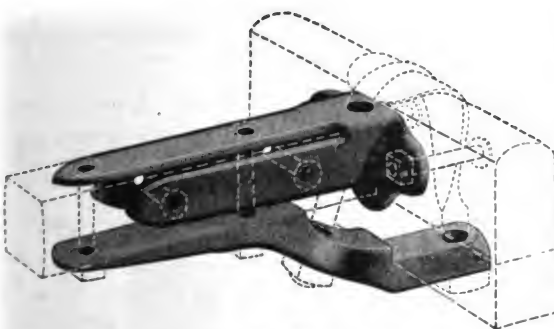
No. 5842  
End Gate Eye for  
Short Chain

These are only random samples picked up in the hope of rousing your interest. They are specimens of a very large and complete line about which you want to know.

**Catalogue  
Sent on  
Application**



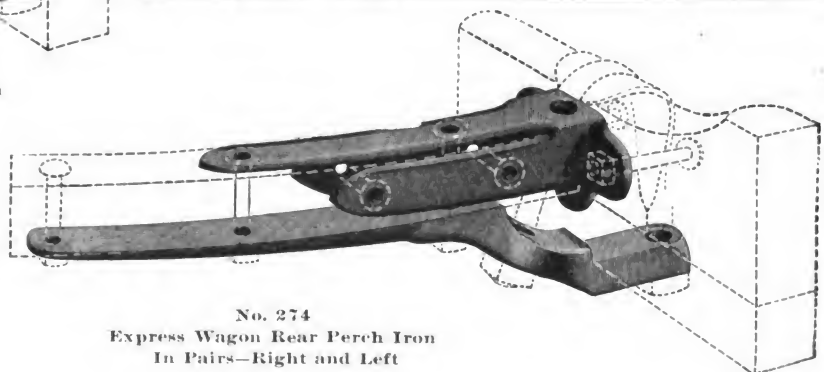
No. 895—Spring Wagon Fifth Wheel



No. 280  
Express Wagon Rear Perch Iron

**The Eberhard  
Mfg. Co.**  
Cleveland, Ohio.

(Send for our Wagon  
Builders' Sheet Cata-  
logues and Brake Pam-  
phlet.)



No. 274  
Express Wagon Rear Perch Iron  
In Pairs—Right and Left

# DON'T BUY GASOLINE ENGINES

Has a wider sphere of usefulness. Has little or no vibration. Can be placed anywhere without expense for foundation. Weighs less than one-half the weight of one-cylinder engines. Please give size of engine required. We make 2, 4, 6, 8, 10, 12 and 16 horse-power. Please mention this paper. Send for catalogue.

until you have investigated "THE MASTER WORKMAN," a two-cylinder gasoline engine, superior to all one-cylinder engines. Cost less to buy and less to run. Quicker and easier started. THE TEMPLE PUMP CO., Established 1853. Meagher and 15th Streets, CHICAGO.

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72p. Book Mailed Free.

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ESTABLISHED 1869

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A Wizard Tubular Does It.



Armature Incased in WATER-PROOF non-corroding brass tube. All brass screws. Friction, Belt or Governor drive. Brush-holders removed without loosening screws. All parts polished brass. Contact and Jump Spark. A TRIAL WILL CONVINCE YOU.

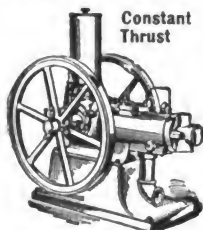
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GOVERNOR DOES AWAY WITH BATTERIES AND SWITCHES.

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INDIANAPOLIS, INDIANA.

Write for catalogue and SPECIAL OFFER.

## The MIETZ & WEISS Oil and Gas Engines



Constant Thrust

STATIONARY and MARINE  
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Adopted by the U.S. and Foreign Governments. Most Economical and Safest Power known. Runs with common kerosene, distillate or fuel oils.

It will pay you to consult me before placing your order elsewhere.

For all Power Purposes. Thousands in use. Highest award for Direct Coupled Engine and Dynamo, Paris Exposition, 1900.

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A. MIETZ, 128-138 Mott St., New York  
Send for Catalogue, Dep. 34.

## ANOTHER LABOR-SAVING TOOL FOR BLACKSMITHS



Weight, 570 lbs.

### No. 6 "BADGER" No. 6

Combined Hand Power Punch and Shear. Easily operated by one man on the lever bar.

Punch  $\frac{1}{2}$  inch hole in  $\frac{1}{2}$  inch material.

Shear,  $\frac{1}{2}$  inch x 4 inch flat bars.

" 1 inch round bars.

Besides this machine, we make a full line of Punches and Shears, both HAND and POWER, for all kinds of work. We will be pleased to have you write us for Catalogue and Prices.

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Janesville, Wis.



EXTENSION AXLE

NUTS

SENT ON APPROVAL

Cure wobbles and make old buggies run like new. Samples free to agents. (Profitable).

Hardware Specialty Co., Box J 10, Pontiac, Mich.

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Vertical 2, 3, 4, 5, H. P.

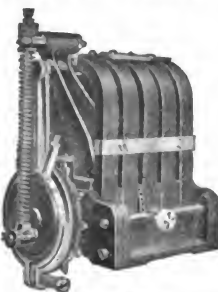
Horizontal 5, 10, 12, 15, 20, 25, H. P.

Designed and Built for BUSINESS.

Catalogue on request.

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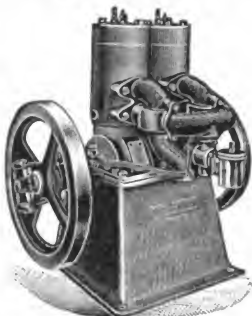


The Goodson Igniter is guaranteed to produce a sufficient spark to start a gas or gasoline engine without batteries or spark coil.

Send for Catalog.

Goodson Electric Ignition Co.

95 Point Street, PROVIDENCE, R. I.



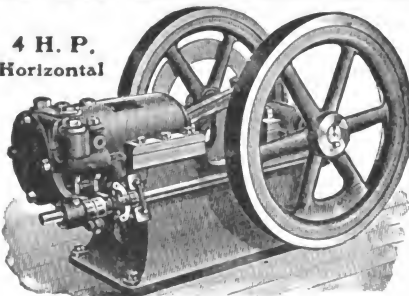
## The Maxwell & Fitch Gasoline Engine

Two cycle, a power impulse every revolution, we use no gears, cranks, cam shafts, valves or valve springs, no engine can be simpler or more durable. If you want a well built engine, one built of the best materials, then just send us a postal for our catalogue and price list.

THE MAXWELL & FITCH CO.  
ROME, N. Y.

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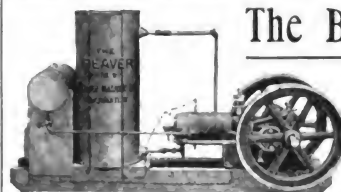
4 H. P.  
Horizontal



Also equipped with pumping attachments. Write for booklet describing full line New Era Gas Engines from 4 to 100 H. P. Special inducements to dealers as agents.

## THE NEW ERA GAS ENGINE CO.

No. 63 Dale Ave., DAYTON, OHIO.



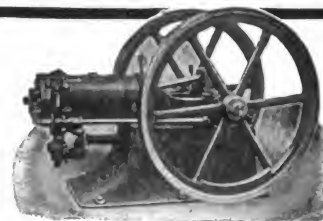
## The Beaver

3 1/2 & 6 H. P. gasoline engine all complete ready to

run. Can be moved anywhere.

Agents Wanted. Write Us.

BEAVER ENGINE CO. 222 East 2nd Street, CINCINNATI, O.

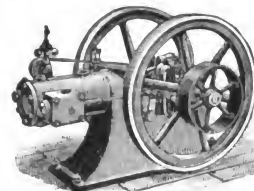


## THE ADVANCE ENGINE FOR PROGRESSIVE SMITHS

No better engine made—a model of perfection, which will stand the most rigid test and be found equal to every shop requirement. Write for our interesting catalogue.

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## THE ENGINE THAT MEETS THE DEMAND OF THE DAY



## THE "WATKINS"

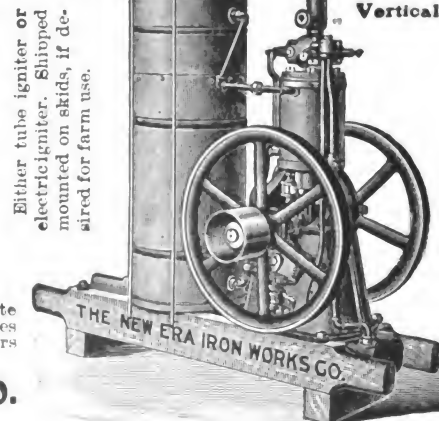
It has always been our aim to build the best engines possible, regardless of cost, and to so systematize their manufacture that they can be sold at a fair price. All sizes from 2 to 15 H. P.

OUR CATALOG IS AT YOUR SERVICE.

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537-549 Baymiller St., CINCINNATI, OHIO.

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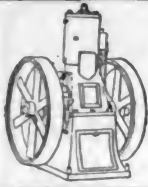
2 1/2 H. P.  
Vertical



Either tube igniter or electric igniter. Shipped mounted on skids, if desired for farm use.

THE NEW ERA IRON WORKS CO.





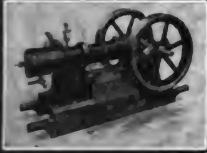
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Safe, Sure, Simple, Reliable and Efficient. Most Economical Power in the World. Especially Adapted for Shops Using Small Power. Cheaper and Safer than Gasolene. No Sparker. No Igniter.

WRITE FOR DESCRIPTIVE CIRCULAR AND PRICES.

WHITEHALL ELECTRIC CO., 32 Park Place, N. Y.

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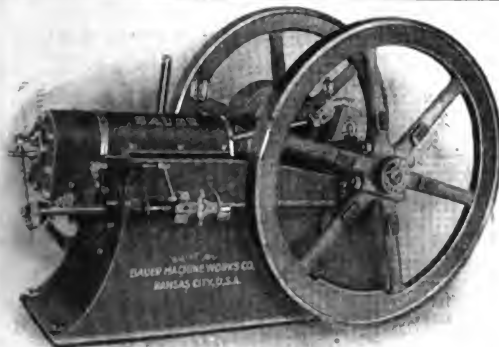


### THE "FOOL-PROOF" GASOLENE ENGINE

The "ELI" Gasolene Farm Engine is the only fit engine to have on a farm, where one is a good way from the repair shop. The "ELI" is so simple that there's nothing to get out of order. It will run year in and year out without the tinkering that other engines require. It is the only engine without cams, gears, and levers. We call it "Fool-Proof" because, if some simpleton or a child should monkey with it, he couldn't make it dangerous. It's absolutely safe. Isn't that the kind of an engine YOU want? Then write for our free booklet, telling how and why it is so simple and safe.

MOLINE PUMP COMPANY, Sole Mfrs.,

MOLINE, ILL.



## BAUER GASOLINE ENGINES..

The Acme of Simplicity and Perfection. If you will examine and compare, piece by piece, you will say there is no other quite so good as the "Bauer." All sizes from 1½ to 20 H.P. Write at once for free catalogue containing long list of letters from satisfied users. Our prices are also very interesting, considering quality.

THE FIRST BLACKSMITH in any town who buys of us gets the agency for his locality, a discount on his purchase, and a commission on his sales. A good engine sells readily. The Bauer is the best.

Write us Today.

Bauer Machine Works Co.

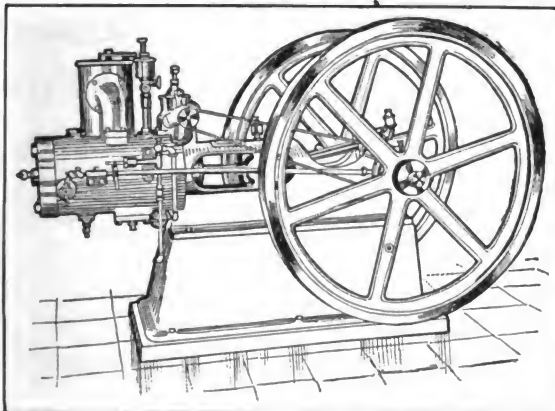
115-120 W. 18th St., KANSAS CITY, MO.

## Dempster Gasoline Engines

SIMPLE, DURABLE, SAFE

Two Cycle Type. Smooth Running, Practically No Vibration.

2  
— TO —  
30  
H. P.



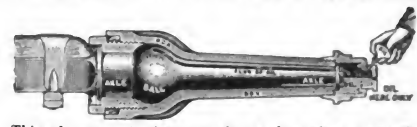
BUILT  
TO  
WORK

READY FOR BUSINESS ANY TIME.

OUR LINE: WINDMILLS, PUMPS, TANKS, WELL MACHINERY, GASOLINE ENGINES, GRAIN DRILLS, CULTIVATORS

DEMPSTER MILL MFG. CO. Beatrice, Neb.

## IT DOES THE TRICK! R. F. D. SPECIAL



This axle runs easier than any other, and requires no attention. "It's a Wonder." STANDARD BALL AXLE WORKS, Lancaster, Pa.

## BUILD YOUR OWN GASOLENE MOTOR



We supply the castings, drawings and all accessories. A complete line of rough castings, also finished Motors for Bicycle, Automobile, Marine or Stationary. A 2-cent stamp gets our catalogue.

STEFFEY MFG. CO.

2941 Girard Ave.,

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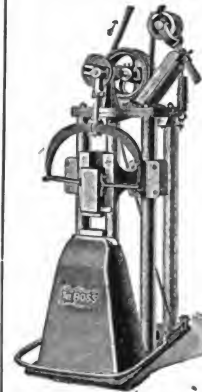


## NOVELTY IRON WORKS

### BOSS HAMMER

For Plow Work, Wagon Work, Heavy Work, Any Work.

G. E. DAVIS, Mgr.  
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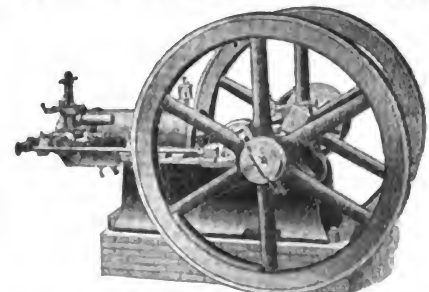
If so, *The Practical Gas Engineer* will tell you how to get the best results from it. A plainly written book telling how to erect, operate and care for gas and gasoline engines. Cloth bound, 152 pages. Sent prepaid, for \$1.00.

AMERICAN BLACKSMITH CO.

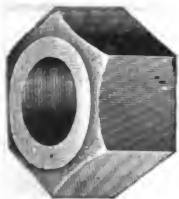
BOX 974, BUFFALO, N. Y.

## The Flour City GASOLINE ENGINES

TRACTION = PORTABLE = STATIONARY



KINNARD-HAINES CO.  
MINNEAPOLIS, MINNESOTA



No. 8

"MILTON"

The price will interest you

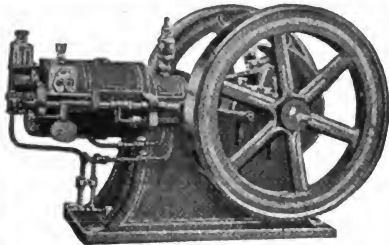
HOT  
PRESSED

Milton Manufacturing Co., MILTON, PA.

Strength, uniformity in quality and finish always the same. They always give satisfaction. All styles—blank or tapped.

# NUTS





## MICHIGAN Three and One-Half Horse

A gasoline engine of full  $3\frac{1}{2}$  guaranteed horse power. In every way suited to general blacksmith and machine shop work. Reliable in construction and reasonable in price. Special price on first engine in any locality, and good terms for agents. Other sizes 2 to 6 horse power for light power uses. Send for free book "Proof Positive" shows how the engines are used and letters from the users.

The Nation Engineering Co.,  
Saginaw, Michigan.



To Gas Engine Operators.

Dynamo Ignition.

## Motzinger Auto-Sparker

No battery to start or run. The original speed-controlled friction-drive dynamo. Driven parallel with engine shaft. No belts. No beveled pulley or beveled fly wheel necessary. For make and break and jump-spark system. Water and dust proof. FULLY GUARANTEED.

We have an attractive proposition for the Dealer in Gas Engine lines. Correspondence solicited. Write for 32 page catalogue, FREE.

MOTSINGER DEVICE MANUFACTURING CO.  
33 Main Street, Pendleton, Ind., U. S. A.

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Direct connected, has been designed especially for the blacksmith, and it is his ever ready helper that works for less than five cents a day, and never tires. It places him on an equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.

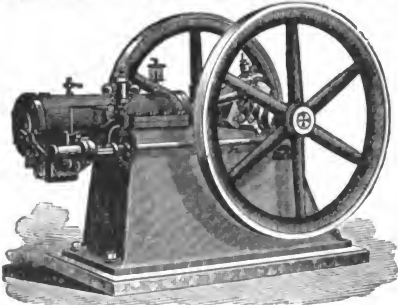
NEW ERA ELECTRIC CO.

Write for circular and particulars.

942  
W. Lake St.  
CHICAGO.

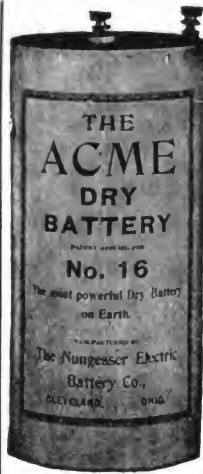
## COLUMBUS GASOLINE ENGINES

ARE THE THINGS FOR BLACKSMITHS



Send for Catalogue 33, Stating Horse Power You Need.

COLUMBUS MACHINE COMPANY  
Columbus, Ohio.



## Don't Hesitate—Just Buy The No. 16 Acme

Absolutely the most reliable Dry Battery manufactured for ignition.

Its long life means marked economy.

MANUFACTURED BY

The Nungesser Electric Battery Co.  
CLEVELAND, OHIO.

General Sales Office, 128 West Jackson Boulevard,  
Chicago, Ill.

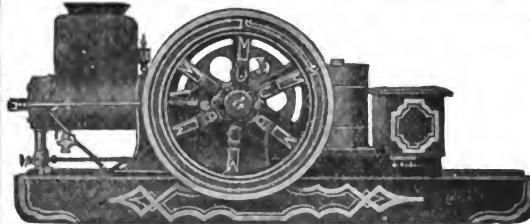
It's the  
**SPARK**  
that  
**COUNTS**



**YOUR ENGINE** will work better, give you less trouble and carry a bigger load, if you ignite with one of our **Improved Mueller Spark Coils**. Furnished for use with batteries or dynamo. WE GUARANTEE our coils against all imperfections in workmanship and material. If your engine doesn't ignite properly, write us. Information cheerfully given. Correspondence solicited.

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## The Easy Starting LAUSON



is built for zero weather. It has no water tank and pipes to freeze up. Two pails of water is all that is required to keep the engine properly cooled. This feature and our improved generator make this an ideal engine for winter work. It will start as easy and work as well at 20 below zero as in summer.

Write for our 1905 catalog describing our line of stationary and portable Gasoline Engines from 2 to 20 H. P. We want blacksmiths everywhere to act as agents.

5, 6 and 8 H. P. Special.

THE JOHN LAUSON MFG. CO., NEW HOLSTEIN, WIS., U. S. A.

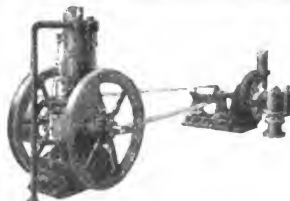
## OTTO ENGINES

### Less Repairs and Less Fuel

It is what an engine costs to *keep it running* that cuts the big figure and not the *first cost*. The St. Anthony & Dakota Elevator Co., Minneapolis, Minn., writes: "In April, '02, we had 92 'OTTO' engines running, all of which gave better satisfaction, cost less for repairs and consumed much less fuel than any others we had tried. During the season of 1902 we bought 35 more 'OTTOS' and now have 127 of them." A splendid testimonial to the merits of the "OTTO" from people who have tried many others.



OTTO GAS ENGINE WORKS, Phila., Pa.  
STANDARD OF THE WORLD



To irrigate, water stock or for any pumping, the best outfit and cheapest to operate is the

## Fairbanks-Morse Gasoline Engine & Pumps

Awarded Gold Medals at World's Fair, 1904

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Engine to run \_\_\_\_\_

Name \_\_\_\_\_

Street No. \_\_\_\_\_

Town \_\_\_\_\_

State \_\_\_\_\_

A Good Set of Bit Brace Nut Wrenches is almost a necessity. A postal sent to us will bring net delivered price.



Do you want a Screw Plate cutting  $\frac{1}{4}$  to  $\frac{3}{4}$ ? Now is a good time to buy. Send for price delivered to nearest R. R. Station. CATALOG FREE

## DON'T BUY A SCREW PLATE

—Until you know what the "REECE" IMPROVED SCREW PLATES cost and have heard our arguments in their favor. It Pays to look around before you buy and find out all you can about the different makes. You will find that the "REECE" SCREW PLATES have more points of **REAL MERIT** than any other kind. You will find that you always get about what you pay for. Low prices mean cheap goods. Our prices are not excessive and when you get a "REECE" SCREW PLATE you get one that will cost only a trifle more than a cheap screw plate and outwear two of them. Quality counts every time.

SOLE MANUFACTURERS  
**THE E. F. REECE CO.,**  
GREENFIELD, MASS., U. S. A.

## Cortland Welding Compound Co.

CORTLAND, N. Y.

Manufacturers of

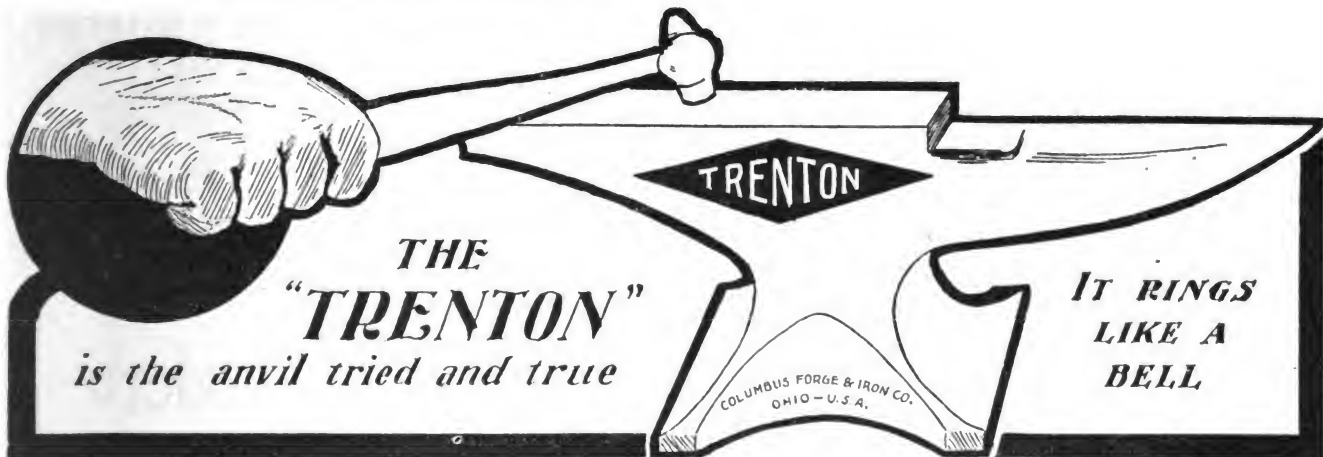
**Climax Welding Compound,**  
**Cherry Heat Welding Compound,**  
and **BORAX-ETTE.**



**BORAX-ETTE** makes steel weld easily. It does not have to be applied between the laps like other compounds, but is used the same as borax. It has no equal for all kinds of steel welding.

**SAMPLES FREE.**

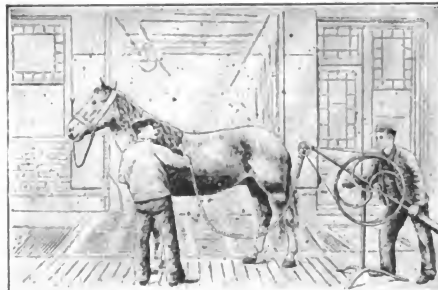
FOR SALE BY DEALERS IN **BLACKSMITHS' SUPPLIES**



## The Celebrated Gillette Horse Clipping Machines

The Guarantee we give you with our Machine is as good as a U. S. Gold Bond.

We are so far in advance of other Machines in improvements that we really have no competitors. Gillette Machines give satisfaction in every way.

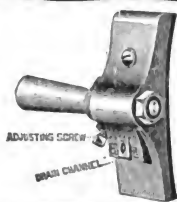


Our claim is as broad as words can make it. The Gillette Clipping Machine is better than any other Clipping Machine in every particular.

The Gillette Machines were the first Horse-Clipping Machines made in any part of the world; many imitations have been put on the market, but none have ever reached our high standard.

Write us for our Catalogue.

**THE GILLETTE CLIPPING MACHINE CO.,** 114 WEST 32D STREET,  
NEW YORK, N. Y.



## Potters Spring Brake Blocks

For Vehicles of all kinds with STEEL OR RUBBER TIRE.  
Have a record of excellency for seventeen years. **o o o**

**The MORGAN POTTER CO.**

SOLE MANUFACTURERS.

CATALOGUES.

FISHKILL ON HUDSON, N. Y.



### We Manufacture SHEARS AND PUNCHES

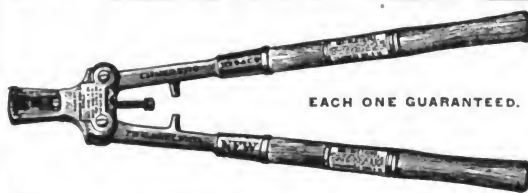
Hand or power, for shearing and punching plates, bars and angles. Send for Catalogue C.  
**BERTSCH & CO.**  
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### RUBBER STAMPS STEEL STAMPS AND STENCILS

SEND FOR CATALOGUE.

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338-340  
WASHINGTON STREET  
BUFFALO, N. Y.



EACH ONE GUARANTEED.

## BOLT CLIPPERS

**CHAMBERS BROS. CO.,**

N. Fifty-Second Street,  
Philadelphia, Pa.



Patented April 29, 1902.

### FREE ON 30 DAYS' TRIAL

No shop complete without it.

Send for one today and be convinced that

### THE REYNOLDS AXLE GAUGE

exceeds all others in simplicity of adjustment and accuracy of gauge. Ask your dealer for this gauge, and if he cannot supply you, write to us direct. Upon request, we will send free descriptive circulars and interesting price list. **WRITE TODAY.**

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### CASH

Always Secures  
BARGAINS and  
ALWAYS WILL

Special Net Price on Sarven Patent Wheels  
(C. B. 50c. extra) with steel and rubber tire

Size of tread	Price per set for wheels with flat steel tire on and hubs bored	Price per set for wheels complete with channel and rubber tire on, and hubs bored			Add to price of wheels for axles and boxes set
		36 and 40	38 and 40	40 and 44	
3/4"	\$5.75	\$13.50	\$14.00	\$14.50	\$1.90 L.D.
1"	5.85	14.50	15.00	15.50	1.90 "
1 1/4"	6.10	16.00	16.75	17.50	2.10 "
1 1/2"	8.25	24.00	25.00	26.00	2.25 H.P.

Both wheels and rubber guaranteed. Repairs Wheels, \$3.50. PROMPT SHIPMENTS. Five set or more, one order, you can deduct 25c. per set as freight allowance. Write for catalogue. We manufacture wheels with Steel or Rubber Tire on, 3-4 to 4 inch tread. Buggy Gears, with wheels and shaft all ready for body, \$16.95 delivered.

The A. Boob Wheel Co., Cincinnati O., U. S. A.



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We want you to represent us in your locality selling

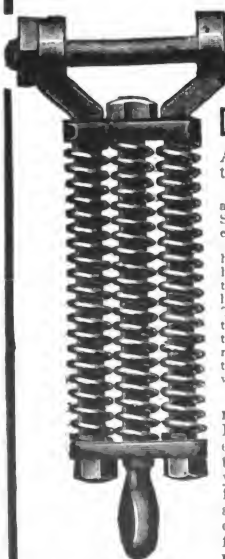
## The Victory Corn and Feed Mills.

Oldest and Best Grinding Mill Made. **STRONG, SIMPLE, DURABLE.** Especially adapted to grinding our corn, shelled corn, wheat, oats, rye, etc. Write for Prices and Particulars today.

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(Established 1876.) **Springfield, Ohio.**

## WE WANT AN AGENT



in every city and town to sell

### BEECHER

### Draught Springs.

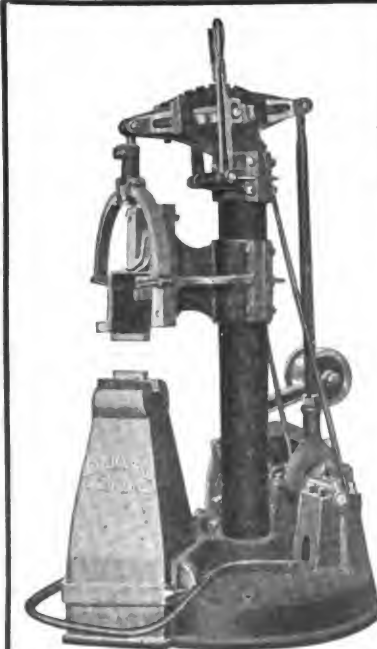
All wagon owners need them.

For simplicity, durability and usefulness, our Draught Springs simply cannot be equalled.

They act as a cushion to the horses' shoulders, they HELP horses START heavy loads, they assist in drawing the load after it is in motion. They prevent collar wounds; they save from twenty to thirty per cent. in harness repairs; prolong the life of the team and increase their working capacity.

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**BEECHER DRAUGHT SPRING CO.**  
NEW HAVEN, CONN.



## The Modern Power Hammer

is what the name implies—up-to-date in every respect.

Ask your dealer or write to us for prices and easy terms.

**Grinnell Mfg. Co.**

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# A BROAD VIEW

of the thread cutting situation convinces you that screw cutting tools of quality are essential to the up-to-date shop equipment, and your search for the best must inevitably narrow down to the

*Little Giant*

**TAPS, DIES AND**

*Little Giant*

**SCREW PLATES**

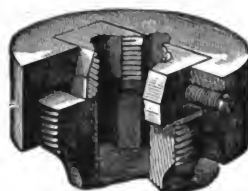
*Little Giant*



Perfect threads at a single cut. The kind with the mottled finish and knurled handles. Known by all first-class mechanics for their quality, durability and accuracy.

Complete Catalogue of all styles of Little Giant tools free upon request.

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56 Reade  
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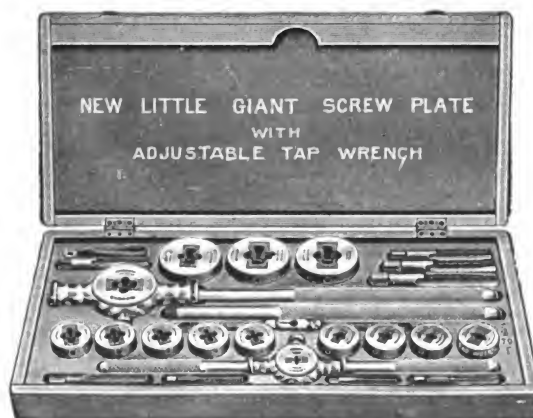


London  
Store,  
149 Queen  
Victoria St.

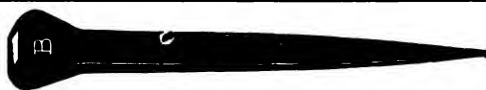


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**GREENFIELD, MASS., U. S. A.**







No. 8 REGULAR HEAD.—Exact size.

**"BRIGHTON" HORSE NAILS**

The letter "B" appears on the head of each nail.



No. 8 CITY HEAD.—Exact size.

**The EQUAL of ANY Nail except "NEW STANDARD."****DEALERS' NET PRICES TO SHOERS.**

No.....	5	6	7	8	9	10	11	12
Box.....	\$3.25	3.00	2.85	2.75	2.70	2.65	2.65	2.65
Lb.....	.13	.12	.11½	.11	.11	.11	.11	.11

FOR SALE BY ALL DEALERS.

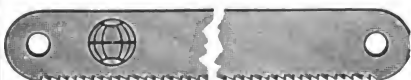
**TRY A FEW OF THEM**

and be convinced of above statement.

Manufactured by

**STANDARD HORSE NAIL CO., New Brighton, Pa.****Your Hack Saw Troubles**

will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



**West Haven Manufacturing Co.**  
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Now made  
of high  
carbon steel.



Guaranteed to be stronger and more rigid than solid steel axles. We make both. Write us

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Catalogue  
A



1,000 Styles  
and Sizes

**THE AKRON-SELLE CO., Akron, O.****ELECTRIC FORGE BLOWERS****EXCEL ALL OTHERS**

A GOOD  
BLOWER  
THAT  
BLOWS  
EVERY  
BODY  
GOOD



Write  
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MODERN MACHINERY  
MAKES THE SMITH'S  
WORK  
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will find it invaluable in his every day work. A practical, scientific treatise on improved methods of shoeing. Special directions given for correcting faulty action in trotters and for shaping shoes to cure different foot diseases. 284 different styles of shoes illustrated and explained. *Cloth bound, 217 pages, Price \$2.00.*

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Kept in stock at Cleveland for immediate shipment,  
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**IRON, STEEL****PIG IRON****COKE****Cleveland, Ohio.**





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WENTH RAILWAY CORRESPONDENCE SCHOOL  
DEPT. 50  
FREEPORT, ILL.

Write to



### LAMB & COMPANY,

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MANUFACTURERS OF  
Powers for Dog-Goat-Sheep  
FOR RUNNING  
Churns, Pumps, Corn Shellers, &c.

WIND MILLS, TANKS, PUMPS,  
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With Montross Telescope Side-Locks is the best roofing in the world for house or barn. Storm proof. Easily applied. Catalogue, Prices and Testimonials free for the asking.

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"EVERYBODY'S FRIEND"



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AGENTS FINE SAMPLE OF  
12 TOOLS IN ONE  
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THREE RIVERS, MICH.  
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WHAT KIND OF  
**CUTS**  
DO YOU  
WISH?



**CUTS** for Circulars, showing exactly what is needed.  
**CUTS** for Booklets, making the matter plain and interesting.  
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**CUTS** for Street Car Cards, attractive and attention-compelling.  
**CUTS** for any purpose, and all of the highest quality.

Three-Color Half-Tones a specialty.

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Cor. S. Division and Ellicott Sts.  
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The Best Design Material Workmanship

O. M. Milk Wagon Gear No. 251

We will exhibit both in New York and Philadelphia, and as in other years we will lead. Our New Gear Catalogue is now ready for distribution and will be sent FREE to any one.

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THE W. T. CO.'S  
**HOOF NIPPER**  
BEATS THEM ALL



### THE TWO LEADERS!

No. 12—Hoof Trimmer, 12 inches long, fully polished and packed one in a wooden box.  
No. 1—13 inches long.



LARSON  
No. 1 HOOF NIPPER  
W. T. CO.

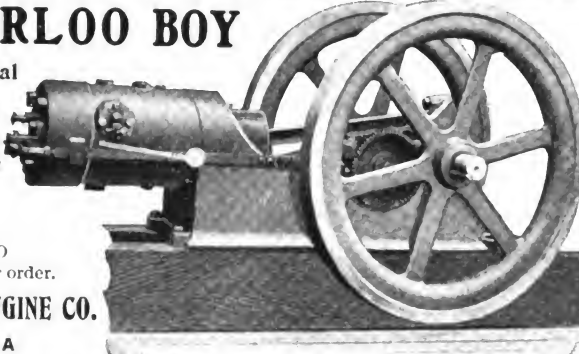
All our tools are hand made out of tool steel. We will send either size, express prepaid, upon receipt of \$1.25, or both for \$2.25, to any part of the United States, if unable to get them from your jobber.

**Address WASHINGTON TOOL CO., Owatonna, Minn.**  
Manufacturers of the Celebrated Larson Pincers and the No. 12 Hoof Trimmers.

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Our Blacksmith's Special  
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The Engine Is Right!  
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Investigate the WATERLOO before placing your order.

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AT THIS SPECIAL LOW SAMPLE ORDER PRICE

**\$50.00** buys a RUBBER TIRED BUGGY. Fine Leather Top. Tires Warranted.

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**YOU WILL NEVER FAIL**

*To Make a Strong, Clean Weld If You  
Use Perfection Welding Compound.*

We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



Perfection Welding Compound will do the trick quickly and neatly. It makes a stronger weld than any other compound manufactured, as proven by the tests it has undergone. Send for free sample.

PRICE CONSISTENT WITH QUALITY.

**PERFECTION WELDING COMPOUND CO., SCRANTON, PA.**



The  
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Patented May 10, 1904.

**BANNER WELDING COMPOUNDS**

Welds at a low heat, does not fly. Saves time and fuel. **Guaranteed** to weld iron to steel, or malleable iron to steel, or iron and steel to steel.

Pass all arguments on other brands of welding compound until you have tried the **Banner Brands**.

**Ask Your Supply House** for the famous 3 A Banner Welding Compound for general welding, and the famous Banner Toe-Calk Welding Compound for fine, smooth, solid Toe-calk welding.

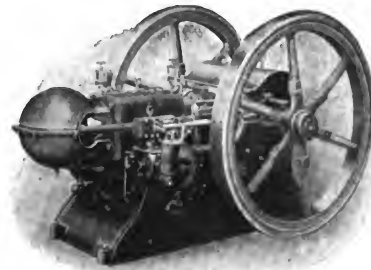
We will send a large free sample to any regular blacksmith.  
**CORTLAND SPECIALTY CO., Sole Manufacturers, Cortland, N. Y.**

MONTGOMERY, Mo., Sept. 5, 1905.

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GENTLEMEN:—The Buffalo No. 200 Geared Blower is the finest and best one I have ever seen. I would not take \$50.00 for it if I could not get another like it. I have showed it to several blacksmiths and they say it beats the xxxxxxxx No. 400. I will never use another Bellows. Another word of praise for the Buffalo No. 200 Blower. I tested the Bellows and it made nearly one-half bushel of dust and dirt a day. The Buffalo Blower burns the dust and makes a cinder, and by actual test saves me one-half bushel of coal per day. If you hear of any skeptical blacksmith tell him to write to me—you do not say too much for your Blower. It is the best tool in my shop.

Yours very truly, C. E. JOHNSON.

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**GAS and  
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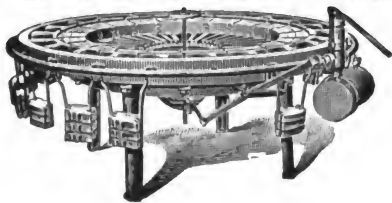
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Suited for  
Blacksmith Shop  
Power.**

Write for Free Catalogue.

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**INVESTIGATE****The Hercules Hydraulic**

**Before  
You  
Buy a  
Tire Setter**

**National Machine Co.**

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**Henderson Hand Power TIRE SETTERS**

Set Tires Cold.  
Keep the Dish right  
Tighten Wood Work  
Pull Broken Spokes  
Jump in New Spokes  
Are Money Makers



**Standard Tire Setter Co.**

KEOKUK, IA.

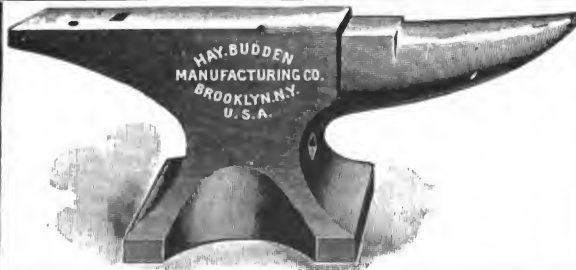
**HAY-BUDDEN SOLID WROUGHT ANVILS**

**The Gold Medal Anvil  
Highest Award**

OMAHA, 1898 PAN-AMERICAN, 1901

Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS.



**OVER 100,000 IN USE**

**WARRANTED**

Experience has proved their worth and demonstrated that "HAY-BUDDEN" Anvils are Superior in Quality, Form and Finish to any on the Market.

**HAY-BUDDEN MFG. CO., BROOKLYN, N. Y.**

VOLUME 5

THE

NUMBER 2

# AMERICAN BLACKSMITH

BUFFALO  
N.Y. U.S.A.

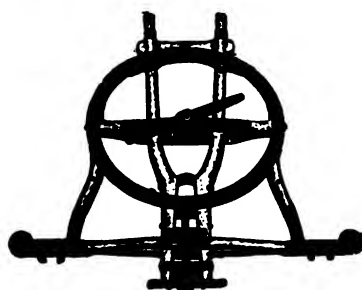
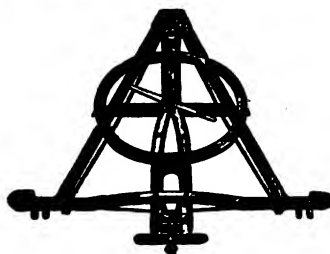
A Practical Journal of Blacksmithing and Wagonmaking

NOVEMBER, 1905

\$1<sup>00</sup> A YEAR  
10<sup>0</sup> A COPY



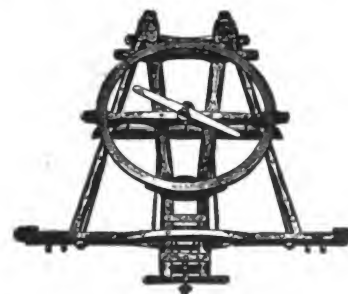
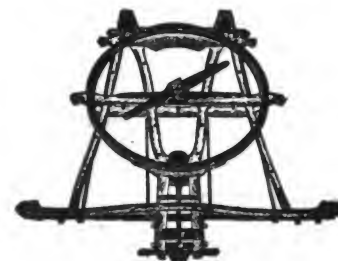
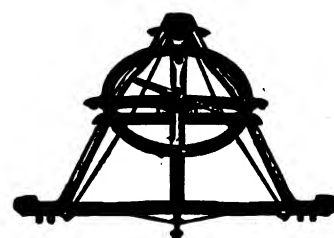
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### Selle Gears

HAVE GIVEN PERFECT SATISFACTION TO THE TRADE FOR 20 YEARS. NOTHING BUT THE FINEST QUALITY OF MATERIAL AND WORKMANSHIP ENTER INTO THEIR CONSTRUCTION. LOOK FOR THE NAME "SELLE," THE STAMP OF QUALITY, ON EVERY GEAR YOU BUY. TAKE NO OTHER. INSIST UPON THE VERY BEST. 1,000 STYLES AND SIZES—SEND FOR CATALOGUE B.

THE  
AKRON-SELLE CO.  
AKRON, OHIO, U.S.A.



# CARRIAGE MAKER and BLACKSMITH TOOLS

## THE "ELITE" BLOWER

is correctly manufactured and is designed to meet the demands of hard service, together with the greatest possible efficiency, durability and convenience.

IT'S A  
MONEY  
MAKER.



Fig. 900, 12 inch.

Manufactured by

THE  
**SILVER MFG. CO.**  
365 BROADWAY  
SALEM, OHIO  
U. S. A.

Hub Boxing Machines, Spoke Tenon Machines, Band Saws, sizes 20, 26, 32 and 36 inch, Forges, and a complete line of hand and light Power Drills, a 19-inch Post Drill and a 20-inch Round or Square Base Drill with Lever or Screw Feed. The last two drills are used extensively by Carriage Builders and others.

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AS  
REPRESENTED.

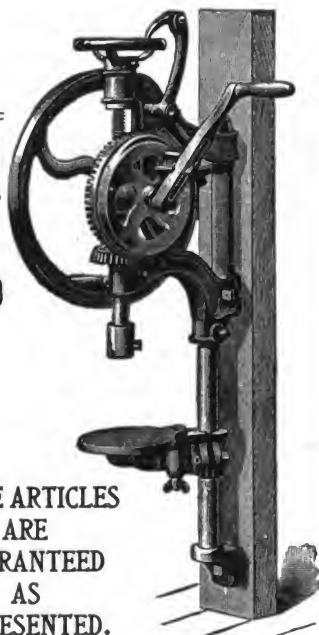


Fig. 731, No. 1.

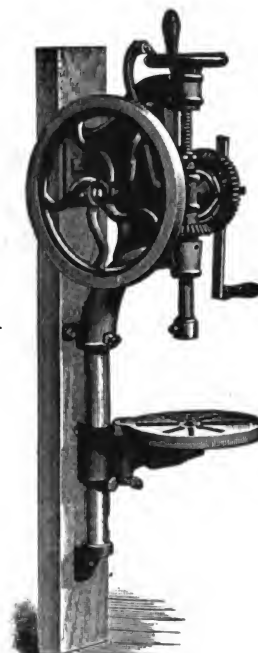


Fig. 742, No. 12.

Special prices are extended to Carriage Makers and Smiths if this paper is mentioned.

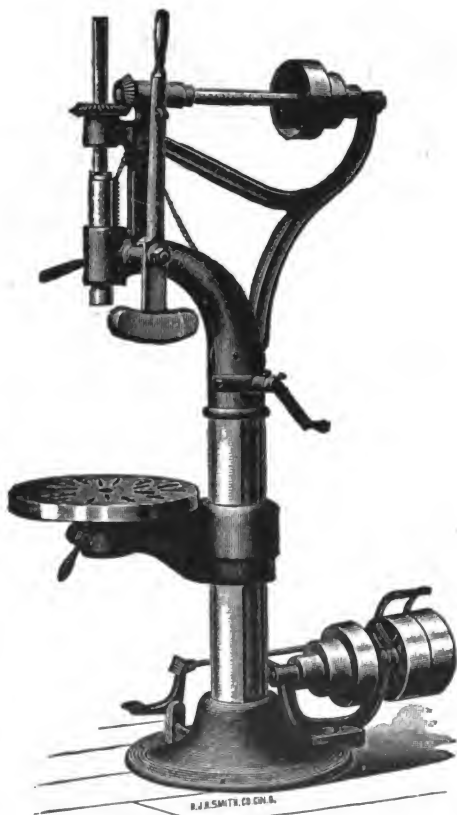


Fig. 850, 20 inch.

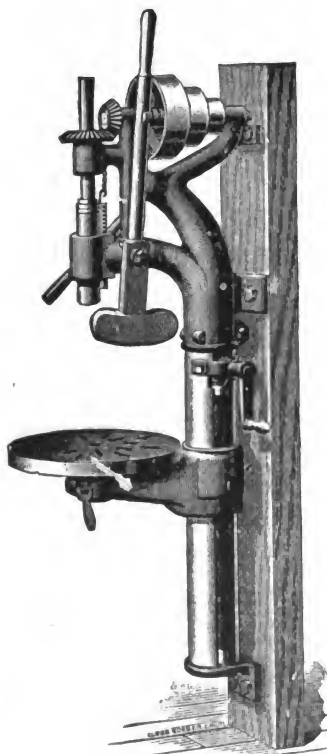


Fig. 727, 19 inch.

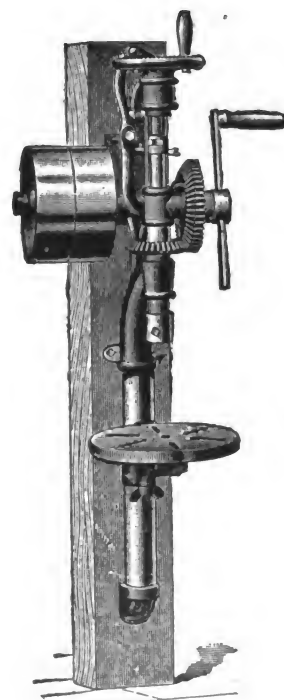


Fig. 746, No. 12.





# MONEY



**EVERYBODY WANTS IT, EVERYBODY NEEDS IT.** Every progressive blacksmith should be willing to consider a clean money-making proposition.

The large number of blacksmiths who are now doing cast iron brazing find it a profitable business. The brazing of cast iron is no longer an experiment as has been demonstrated to the most skeptical in all parts of the country. Read the testimonials below. We have hundreds more just like them.

## ONE DOLLAR

invested now will start you in this profitable business. Our compound **"BRAZIT"** and your mechanic's knowledge of heating iron is all that is necessary. No special equipment is required. The work is done in your forge or with a brazing torch.

The field for cast iron brazing is unlimited. Many articles made of cast iron are being broken daily in every community. These are discarded as worthless and must be replaced by new ones at large expense. With **"BRAZIT"** you can mend them as good as new, charging a good price for the work and finding the owners of the broken parts more than willing to pay your price. It is easy to see why this is so when you remember that you are saving them not only the cost of replacing their broken casting but the expense incurred by the delay waiting for a new one to replace it. When properly used **"BRAZIT"** is guaranteed to successfully mend broken parts of machines, gears, agricultural implements, pumps, wind-mills, printing presses, pulleys, engines, stoves, automobile parts, sewing machines, lawn mowers, tools of all descriptions and anything made of cast iron.



**"BRAZIT"** will also successfully mend cast iron to wrought iron and steel to cast iron and all the joints will be as strong as before they were broken.

SOUTH DARTMOUTH, MASS.  
I have used your compound and it worked O. K. Wish I had had some of it before. THEODORE BRIGHTMAN.

SHARON, S. C.  
I received the trial set of "Brazit" and can say it beats anything I ever saw. It does just as claimed. I put together a broken piece of cast iron and it was stronger than before it was broken. C. P. LOWRENCE.

WESTFIELD, MASS.  
We acknowledge the receipt of your sample of "Brazit," which we have tried and found satisfactory. POPE MANUFACTURING CO.

Hundreds of blacksmiths are using **"BRAZIT"** regularly, and find it to be a profitable side line. We want you to take up the work in your section. It means money in your pocket. You invest practically nothing, and the profits are large. In order to get you started, we have put up a one dollar sample working set with which you can braze a large number of pieces.

**We Send this Set for \$1.00**

**Postpaid to any part of the World.**

You cannot afford to overlook this opportunity. Send \$1.00 to-day and we will forward the set immediately, sending you printed directions.

OUR REGULAR WORKING SET, a Complete Outfit, with full plain directions, will be sent to any address for **\$5.00**

**U. S. Brazing Compound Co.,**

(INCORPORATED)

113-115 So. Second St.,

NEW BEDFORD, MASS.





PLATE PATTERN.



# CAPEWELL HORSE NAILS

*are the*  
**Leading Nails of the World**  
*and the*  
**Best for all Classes of Work**

The Best Driving Nails  
 The Best Nails to Hold  
 The Safest to Use  
 The Most Perfect in Form and  
 Finish

PLAIN PATTERN REGULAR HEAD.

PLAIN PATTERN CITY HEAD.

MADE BY

**The Capewell Horse Nail Company**  
 HARTFORD, CONN.

*The largest manufacturers of Horseshoe Nails in the World*

## BRANCHES

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 Philadelphia: 323 Arch St.  
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 Buffalo: 11 Ellicott St.  
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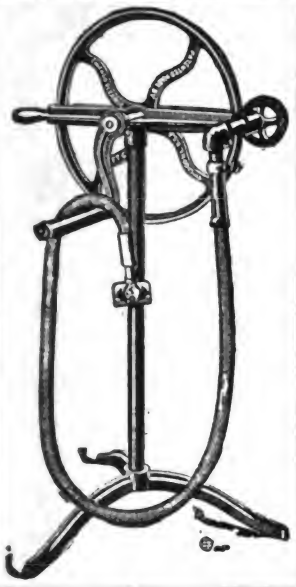
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 St. Louis: 12-14 North 12th St.  
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CORRUGATED PATTERN.



ALL OVER THE WORLD!

# The 1902 CHICAGO CLIPPER



**Price, \$10.75**

"Stewart's Patent" is recognized as the Greatest Clipping Machine ever invented.

More of them are sold every day ten times over than all other makes combined. Each one is sold under a positive guarantee to clip faster and turn easier than any other machine made, regardless of price, or money refunded. All gearing is cut from solid metal, and unlike any other machine made, it can be turned with either the right or left hand.

## IT'S EASY MONEY

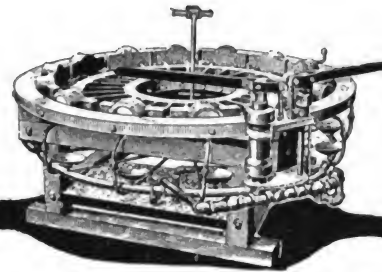
blacksmiths make using this clipper. Horse clipping is now a part of every up-to-date horse shoeing establishment. Why, look at the profit. You can clip a horse in 30 minutes with this machine, and every horse owner recognizes the advantages of clipping.

Send \$3.00 and machine will be sent C. O. D. for the balance.

Catalog on request.  
Yours very truly,

## Chicago Flexible Shaft Co.

186 Ontario Street, CHICAGO.



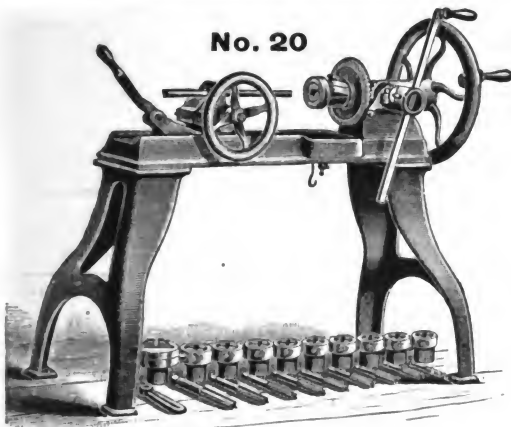
# The New Way

Is better not because it is new, but because it gives more durable work at a far less cost and with a saving of 600 per cent. in time. The new way to set a tire is with the

## West Tire Setter.

This machine consists of powerful hydraulic rams set around a circle and operated by a pump. It is possible to place a pressure of 50 tons on each of the 18 rams of the No. 3 machine if you want it, or as much less as is required (an automatic pressure check stops the pressure at the right moment). Any manufacturer or repair man will find The West the greatest money maker he ever had anything to do with.

THE WEST TIRE SETTER CO., Rochester, N. Y.



No. 20

Write for Catalog and get our Latest Offer to Blacksmiths, Carriage Makers and Repair Men.

MADE BY

## WILEY & RUSSELL MFG. CO.

Greenfield, Mass., U.S.A.

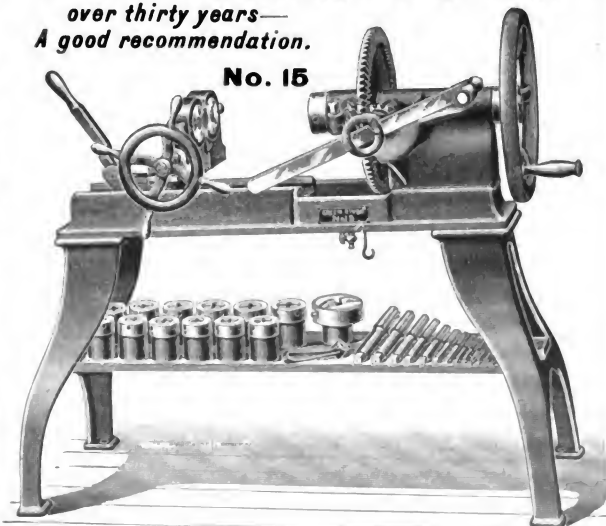
ALSO MAKERS OF TAPS, DIES, SCREW PLATES AND ALL KINDS OF BLACKSMITHS' TOOLS.

# GREEN RIVER BOLT CUTTERS AND NUT TAPPERS

## Strong and Reliable

Hundreds of our Machines have been in use for over thirty years—  
A good recommendation.

No. 15

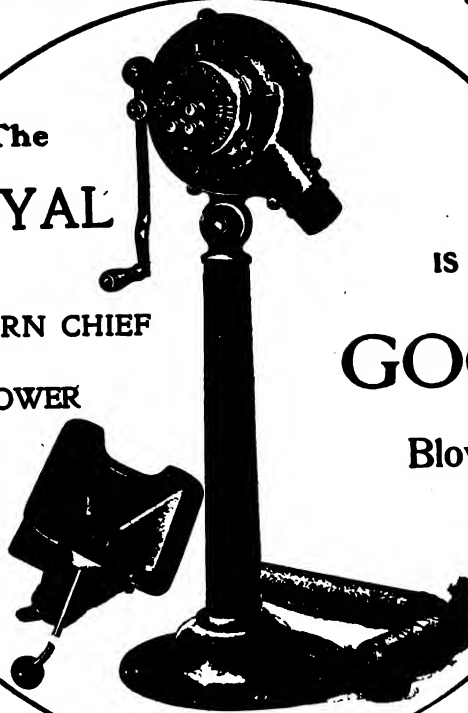


# THREE GOOD THINGS

"ASK THE DEALER."

The  
**ROYAL**  
WESTERN CHIEF  
BLOWER

IS A  
**GOOD**  
Blower



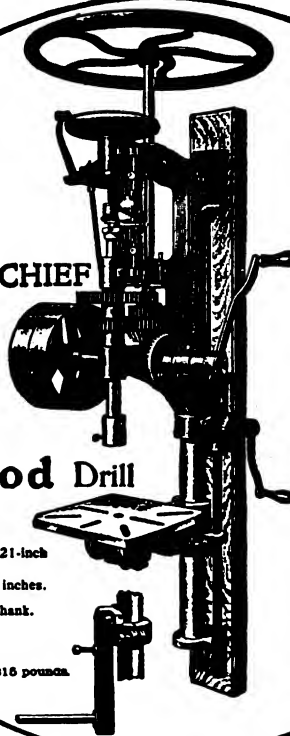
## ROYAL BLOWER

Crank turns right or left.  
Its operation is easy and noiseless.  
Blast is powerful. After-blast lasting.  
Gears and Boxes are phosphor bronze and steel.  
No spiral or worm gears.  
Fan, 12 inches. Weight 100 lbs.  
Fire-pot measures  $9 \times 11\frac{1}{2} \times 4$  in. inside.

## No. 14 DRILL.

This Drill has set the pace for all.  
It simply does everything itself.  
Seems to have brains.

THE  
WESTERN CHIEF  
DRILL  
No. 14  
Is a Good Drill



It has independent quick return by means of which the operator can rapidly withdraw the bit at will, without stopping or reversing motion of machine. Or it can be set to drill any depth desired and will automatically (whether running by power or hand) reverse itself, withdraw the bit, and start drilling again and again indefinitely; all without stopping the motion of machine, or turning it backward. This feature is independent of Drill, and need not be used unless desired.

It has mechanical device for raising and lowering the table.

Drills to center of 21-inch Circle.  
Bores from 0 to  $1\frac{1}{4}$  inches.  
Takes Bits  $\frac{1}{8}$  or  $\frac{1}{4}$  Shank.

Weight, 815 pounds.



The  
**Royal**  
No. 100  
Forge  
Is a  
Good  
Forge

Hearth,  $33\frac{1}{2} \times 46$  inches.  
Pan, 12 inches.  
Height, 50 inches.  
Weight, 275 pounds.  
Length over all, 64 inches.

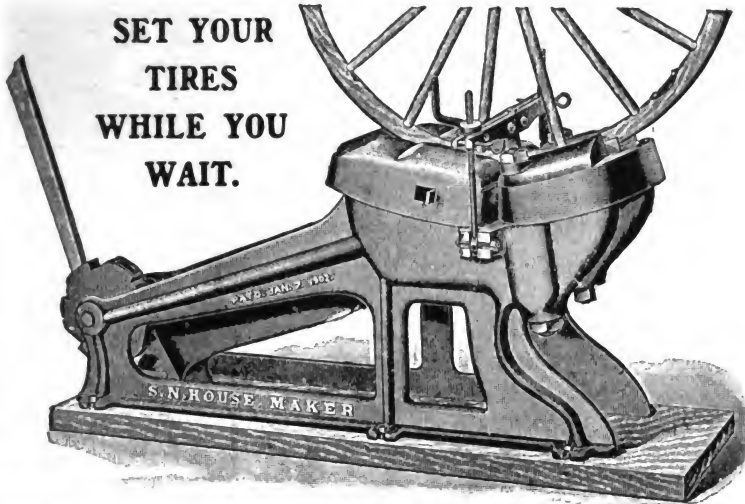
No. 100 ROYAL FORGE—An all-around Forge for the lightest and heaviest work.

We have about one hundred other "GOOD THINGS" in the way of Forges, Blowers and Drills for you to select from.

## CANEDY-OTTO MFG. CO.

CHICAGO HEIGHTS, ILL.

SET YOUR  
TIRES  
WHILE YOU  
WAIT.

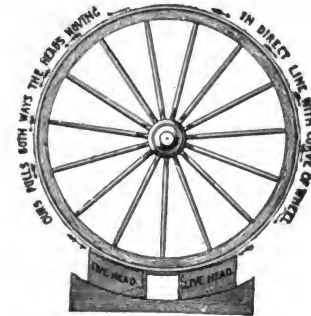


## THE HOUSE COLD TIRE SETTER

Although we have been on the market only three years we have nearly **2,000 in successful use to-day**. This alone would demonstrate the fact that a successful Cold Tire Setter has been made after 20 years hard work and after 15 patents have been issued to other inventors; and these inventions, you must admit, have comparatively all been failures. But don't let that discourage you. The first locomotive, sewing-machine and harvester were failures, but these machines are now successful and so is our machine. It is simple and works on the principle of the hot tire shrinker. It can't be broken, and you can't make a mistake in buying it.

Write us for catalogue and prices.

This cut shows that, when the keys grip the tire in each head, and the heads are brought together, that they move with the circle of the wheel, and pull the tire from both ways round the wheel tightening it nicely, and cannot kink the tire nor injure the felloe; but simply shrink the tire cold in a short space between the two heads just as the hot shrinker has always done.



We are now offering to the trade our new wonderfully improved machine. This new improvement is the third one we have had patented, and it practically doubles the value of the machine to the Blacksmith. There never was anything offered to the trade that possessed any such value.

## THE HOUSE COLD TIRE SETTER CO.

Office and Factory, 216 to 220 South Third St.,

ST. LOUIS, MO.

**JONES WHEELS  
BEST ON EARTH**

**PHINEAS JONES & CO.**  
Newark, N. J.

# BARCUS STOCKS

## FILL EVERY SHOP REQUIREMENT

They are simple, strong and solid, safe and sure to hold, have no ropes and pulleys to tangle and break, no bracing to roof or floor, can be quickly and easily adjusted to any position convenient to the shoer. More Barcus Stocks are used in the up-to-date shops throughout the country than any other horse stock on the market. Barcus Stocks are perfectly reliable, and are fully guaranteed. True, they are not the CHEAPEST but they are the BEST. You run no risk of being injured if you use Barcus Stocks to hold the vicious horse or mule

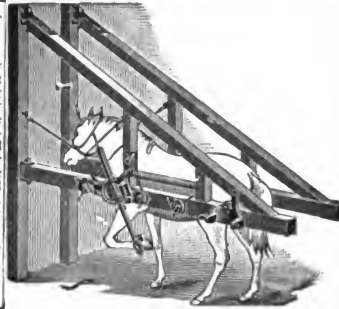
## BARCUS STOCKS

Are giving perfect satisfaction to thousands of Shop Owners.

MINNEAPOLIS, Minn., Jun. 22, 1905.  
Geo. Barcus & Co., Wabash, Ind.

Gentlemen:—In reply to your favor of the 6th would say that I cannot praise our "Barcus Horse Shoeing Rack" too highly. It is a great labor saving device and is giving entire satisfaction. I am sure if the blacksmiths throughout the country would but give the Barcus Rack a trial, your sales would be tremendous, for once having tried them, they would and could not be without a Barcus Rack. There is nothing I need in the way of repairs.

Thanking you for your attention, I am respectfully yours,  
W. J. YOUNG, 18 No. 2d Street,  
Minneapolis, Minn.

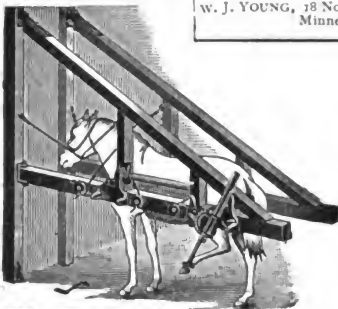


WEST UNION, Ill.,  
Sept. 21, 1905.  
Messrs. Geo. Barcus & Co.  
Wabash, Ind.

Gentlemen:

The Barcus Stocks have just been installed in my shop. I am just recovering from a broken rib which I received three weeks ago, but was anxious to get hold of the worst mule in the county. I shod him with all ease to myself and mule. As long as I am in the business the Barcus Stocks will be my right bower.

Respectfully,  
J. A. Harmon.



ADRIAN, Mich., Sept. 28, 1904.

Mr. Geo. Barcus, Wabash, Ind.

Dear Sir:—I have used your Horse Stocks now for three months. Shod about 17 of the worst bronchos I ever saw with perfect success.

Yours,  
G. F. Ball.

ASHLAND, Ill. May 14, 1905.

Mr. Geo. Barcus, Wabash, Ind.

I wish to say that the horseshoe rack we bought of you gives perfect satisfaction in every respect.

Yours respectfully,  
Hodgins & Douglass.

## ALL OF THE OBJECTIONABLE FEATURES

of the cheap stock have been eliminated. The Barcus Stock stands perfect in every detail.

When ordering give height of shop from floor to ceiling.

Our complete catalogue will be sent to you free upon request. It tells all about our well known stocks and will interest you.

Write today.

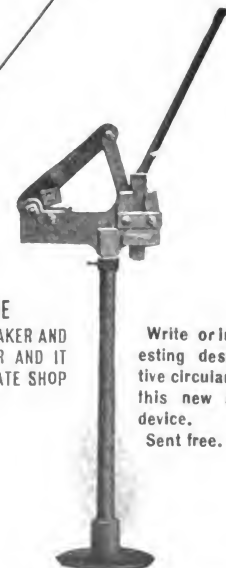
**GEO. BARCUS & CO.,**  
**WABASH, IND.**

U. S. A.

Box 61.

THE BARCUS  
TOE CALK MACHINE  
IS A MONEY MAKER AND  
A MONEY SAVER AND IT  
SHOULD BE IN EVERY UP-TO-DATE SHOP

HAS A RECORD  
OF FIVE TOES PER MINUTE AND  
IS GIVING PERFECT SATISFACTION  
WHEREVER USED. COMPLETE YOUR  
EQUIPMENT BY INSTALLING ONE.  
WRITE FOR PARTICULARS.



Write or interesting descriptive circulars of this new shop device.  
Sent free.




**RUBBER RUNABOUT, \$35.00**  
**TIRED**  
**TOP**  
**BUGGY, \$27.50**



**BUGGY TOPS, \$4.50**

Write for 100-page Catalogue. It's free. Compare Our Prices.  
**BUOB & SCHEU,** Estab. 1883 500-520 EAST COURT ST. CINCINNATI, OHIO.



**Lathes and Drill Presses**  
 Especially for Blacksmiths and Machinists, also Hand and Power Planers and Shapers and Machinists' Supplies.  
 Catalogue M.  
**SHEPARD LATHE CO., 132 W. 2d St., Cincinnati, O.**

**PATENTS** **PROTECT YOUR IDEAS**  
 No Patent, No Fee. Consultation Free. Established 1864.  
**MILO B. STEVENS & CO.,**  
 852 14th St., Washington.



**Igniter Dynamos**  
 For all Classes of **GAS ENGINES** for make and break or jump spark systems. Our latest type price \$15. Write for circular of magnetos, etc.  
**THE CARLISLE & FINCH CO.**  
 243 E. Clifton Ave. Cincinnati, O.

## HAVE YOU TRIED

## LAFFITTE WELDING PLATES

If not, send for a sample. They make difficult welds easy. Easy welds economical. Welding steel and iron at a low heat, saving one-third in time and fuel.

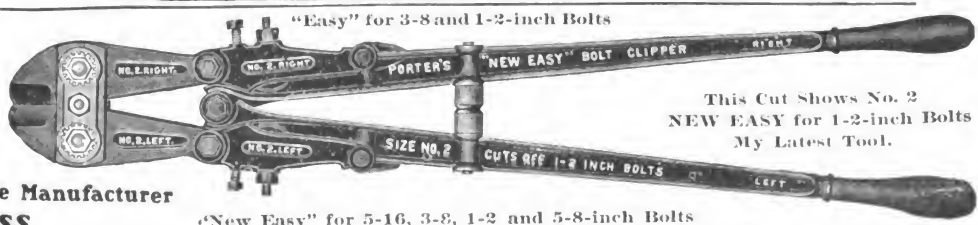
**SEND \$1.00** for three heavy and three light plates as a trial order. All charges prepaid.

FOR SALE BY ALL DEALERS.

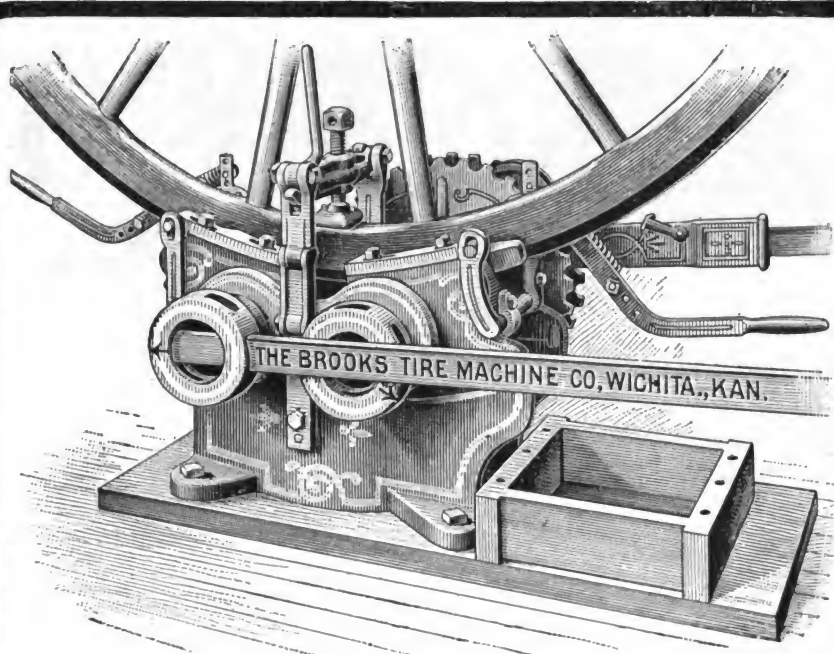
**F. R. PHILLIPS & SONS CO.,**  
 Penna. Building, Philadelphia, Pa.

## PORTER'S THE BEST BOLT CLIPPERS

**H. K. PORTER, Sole Manufacturer**  
 EVERETT, MASS.



"New Easy" for 5-16, 3-8, 1-2 and 5-8-inch Bolts



## A SPECIAL OFFER

we wish to make you on The Brooks Cold Tire Setter will be mailed if you will write us now. The Brooks is manufactured by the longest established and most experienced builders of edge grip cold tire setters in the United States. Remember that time and experience must precede perfection. The Brooks is the only edge grip cold tire setter indorsed by the United States Government and in use in the Government shops. Why? Because it met all the requirements and has no equal. The best is the cheapest. Manufactured in different sizes. Send us your address.

## SENT FREE FOR THE ASKING.

A new book that every blacksmith should read. It is nicely illustrated and treats on subjects of vast importance to you. You of course want to run your shop in a way that it will make you the best possible profit and increase your business by giving the best satisfaction to your customers. We will gladly give you this book together with a pocket memorandum book with gold embossed cover containing forty pages. Send us your address now.

## THE BROOKS TIRE MACHINE CO.

Wichita, Kansas, U. S. A.

## HAND FORGED



## BUTCHER KNIVES

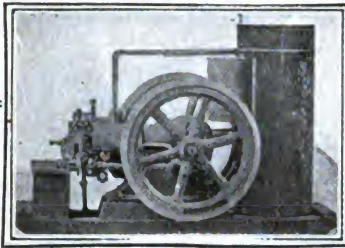
## A GOOD SIDE-LINE

Hundreds of blacksmiths are making large profits by selling these blades. Each one is fully warranted. Made of Sanderson Steel. Round or riveted. All sizes from 5 to 8 inch. Handles ready to put on, 1c each.

**\$ .15 EACH**  
**\$ 1.50 DOZ.**

Hand Forged Razors, ready to use, 40 cents each.  
 Pocket Knife Handles in variety, 10 cents each. Send for sample.

**WOODWORTH KNIFE WORKS, NUNDA, NEW YORK**



Designed for the Blacksmith. **Our 4 H.P. Engine**

Fills every shop requirement and is always ready for business. Giving perfect satisfaction to hundreds of shop owners. Simple, strong, substantial. Best material and finest workmanship. Write for our Catalogue. Sent free for the asking. **ROCKFORD ENGINE WORKS, Rockford, Ill.**

# STARRETT TOOLS

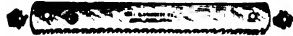
THE  
STANDARD  
FOR

ACCURACY, DESIGN, WORKMANSHIP, FINISH,

**L. S. Starrett says:**

"If you find any better tools than Starrett Tools—buy them."

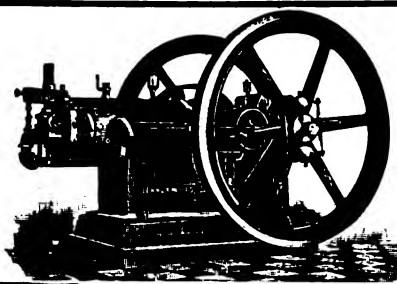
# HACK SAWS



STARRETT QUALITY.

Complete Catalogue No. 17 A.H. sent on request. You ought to have it.

**THE L. S. STARRETT CO.,**  
ATHOL, MASS., U. S. A.



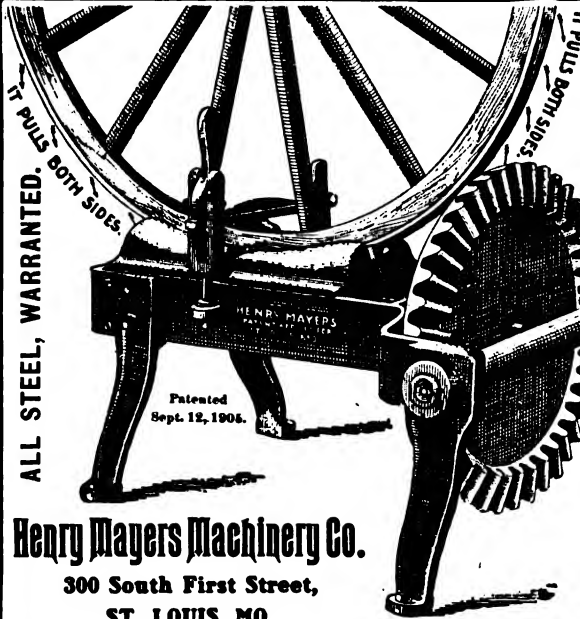
# Lennox Gasoline Engines

MADE IN ALL SIZES.

Built especially for **Blacksmith shop** power. It means money in your pocket to find out about our engines before placing your order.

WRITE AT ONCE FOR NEW FREE CATALOGUE.

**Lennox Machine Company,**  
110 9th Ave., MARSHALLTOWN, IA.



# MAYERS COLD TIRE SETTER

The only Cold Tire Setter made in which both heads come together at same time.

C. W. Berry, Lone Wolf, Okla.,

Sept. 30, says: "I have set 142 tires with the machine and haven't had a single kick.—The machine has given universal satisfaction." The machine reached him about August 10th.

A. W. MORRIS, Groesbeck, Texas, writes September 8, '06: "The machine does the work the easiest and most perfect of any I have seen, and the pulling the tire both ways takes with all that see it. So inclosed find Post Office order, etc."

**Henry Mayers Machinery Co.**

300 South First Street,  
ST. LOUIS, MO.

# PETER WRIGHT AND SONS ANVILS

RANK ABOVE ALL OTHERS. AT THE LOUISIANA PURCHASE EXPOSITION THEY WERE

OUR EXHIBIT AT ST. LOUIS, UPON WHICH WAS BESTOWED HIGHEST AWARDS BY THE EXPOSITION JURY  
**WIEBUSCH & HILGER, Ltd.,** 9-15 Murray Street, New York City.

# ROOTS' ACME HAND BLOWER



**Durabil-  
ity and  
High Power  
Combined**

## ROOTS' Acme Hand Blower for Blacksmiths

Has the unqualified endorsement of every mechanic who has used it. Equalled by no other blower on the market. The outcome of twenty years of experience.

Absolutely every weak point has been eliminated in this new machine. It is the only blower for the up-to-date shop. Any smith can now renew the bronze bearings in the new blower in a very few minutes.

Ask your hardware merchant about it. It gives perfect satisfaction everywhere. Leads them all. Newest in design, most durable in construction, highest in efficiency.

**Net price with box and connecting pipe for tuyere**

**\$15.50**

Write for details. Let us tell you more about it.

**DROP US A POSTAL.**

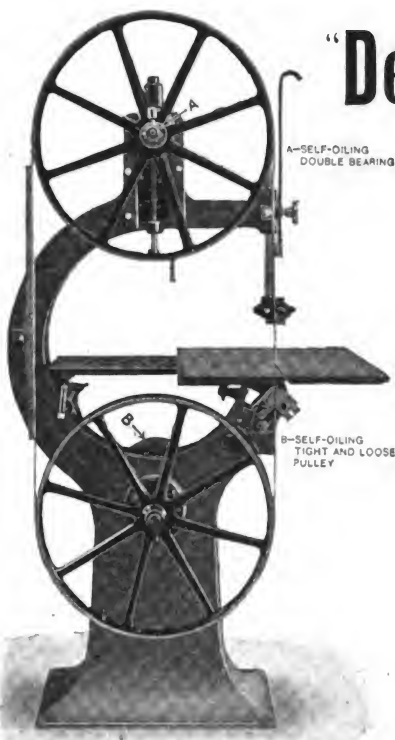
**P. H. & F. M. ROOTS CO.**

NEW YORK OFFICE:  
120-122 Liberty Street.

Connersville, Ind.

CHICAGO OFFICE:  
1547 Marquette Building.

DEPARTMENT 'A.



**"Defiance"**

A—SELF-OILING  
DOUBLE BEARING

B—SELF-OILING  
TIGHT AND LOOSE  
PULLEY

Band Saws,  
Swing Saws,  
Wood  
Jointers,  
Rip and  
Cut-off  
Saws,  
Blacksmith  
Forges  
and  
Post Drills.

Give us a chance to  
send Circulars.

27 IN.

**THE SIDNEY TOOL CO.,  
SIDNEY, OHIO.**

# A GUARANTEED HOOF CURE

**Mr. Blacksmith**

Would you be interested in learning how to pick up a good many extra dollars in your business with very little extra work? Would you like to increase your business—make it bigger—make more money and make more satisfied customers? You can do it and do it easily with

## O. K. Hoof Remedy

Hundreds of blacksmiths are doing it today and so can you. We want you to sell and recommend O. K. Hoof Remedy to your trade, and this is how we suggest you do it: First, we want you to test it. We want you to KNOW from actual experience what it will do so that you will have confidence in it—so that you will be enthusiastic over its merit. We will stand the risk if it does not do what we claim for it. For example, we offer \$100.00 for any case of Contracted Feet, Corns, Dry, Cracked, Brittle Hoofs, Scratches, Sores, Thrush and Quarter Cracks. It fails to cure except in fonder when used as directed. We do more—we say to you, and you can say to your customers, back goes your money if it fails. You take no risk. Send for a trial can and get our special liberal terms to blacksmiths. We want you to handle this remedy in your locality. You can sell lots of it and make money. Send today and "clinch" the agency.

**THE O. K. STOCK FOOD CO.**  
Room 450 Monon Building  
CHICAGO

**O.K. HOOF REMEDY  
KEEPS HOOFS O.K.**

**Bittenbender & Co.,  
Scranton, Pa.**

Carriage and Heavy Hardware,  
Blacksmith Supplies, Iron and Steel Stock,  
Contractors' Supplies.



A  
Cant Slip



B  
Steel Center



C  
Solid Steel



D  
Mud

**SOLE DISTRIBUTORS OF  
CANT SLIP CALKS  
AND  
SHOES.**

Scranton, Pa., Nov. 1st, 1905.

To the Blacksmith—

Last month we gave you a short description of our four styles of calks, and from the large number of complimentary letters and orders received, we can assure you that it will be to your advantage to get in line by deciding now, that "Cant Slips" are what you want. Better still, to further convince you, write us for sample calks and prices.

This is, as you know, a great era of advancement in American manufacture and the trend of movement is FORWARD. We head the procession with our B or Steel Center Calk, which is distinctly superior in construction and durability and is in a class by itself. For use on city pavements our A or Cant Slip Calks have been imitated but not successfully.

The question now confronting the Blacksmith is, what make of calk embodies the principles necessary for durability, etc.

After years of experience selling calks and blacksmith supplies, we offer you four styles of removable calks that are unequalled and can commend them as the very best thing on the market today.

We have placed the calks with most of the leading blacksmith supply houses, from whom we would be pleased to have you buy your supply, but if you find no one carrying a stock in your territory, we would be pleased to supply your wants.

Give the "Cant Slips" a trial and you will be thoroughly convinced and satisfied of their merit.

Yours very truly,

BITTENBENDER & CO.



## Two Good Works on Horseshoeing

**A Text Book on Horseshoeing**, by A. Lungwitz. A complete treatise on anatomy, shoeing, bad feet, interfering, etc. Cloth bound, 168 pages, 141 illustrations. **\$2.00**

**Magner's A B C Guide** to sensible horseshoeing. Cloth bound, 130 pages, 400 illustrations. **1.00**

Sent postpaid on receipt of price.

**IT TELLS YOU HOW TO PAINT** Carriages, Wagons and Sleighs. Gives full directions for all kinds of work. Full of good receipts and useful hints.

**Practical Carriage and Wagon Painting**—A new enlarged edition of a standard book by M. C. Hillick, price, postpaid. **\$1.00**

**AMERICAN BLACKSMITH CO., Box 974, Buffalo, N. Y.**

## THE Little Giant

**Combined Punch and Shear.**

**The Most Powerful Lever Punch and Shear Made.**

This is not a new machine—only a new cut showing the improvements we have lately added—making it more valuable for the blacksmith. It is made in three sizes. No. 1 will punch  $\frac{5}{8}$  in. hole in  $\frac{1}{2}$  in. iron; cuts iron  $\frac{3}{4}$  in. thick and 1 inch round. Weight, 500 lbs. No. 2 will punch  $\frac{3}{4}$  in. hole in  $\frac{3}{4}$  in. iron, cuts iron  $\frac{3}{4}$  in. thick and  $\frac{7}{8}$  in. round. Weight, 350 lbs. No. 3 will punch  $\frac{1}{2}$  in. hole in  $\frac{3}{4}$  in. iron, cuts iron  $\frac{3}{4}$  in. thick and  $\frac{3}{4}$  in. round. Weight 275 lbs. Each machine is equipped with **five** sets of punches and dies. This machine is made for the blacksmith shop and we **DO** claim that it is decidedly the best on the market for that place, and can furnish any amount of testimonials to that effect.



**For Sale by your Jobber. If Not, Write Us. Send for Circular.**  
**LITTLE GIANT PUNCH & SHEAR CO., Sparta, Ill.**

**NORTHWESTERN HORSE NAILS**  
 PATENTED CHICAGO  
 FOR  
 STRENGTH  
 SAFETY  
 AND  
 QUALITY OF MATERIAL.

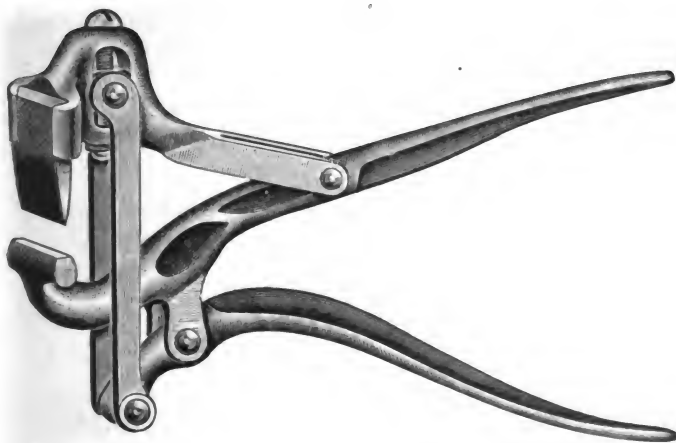
**Northwestern Horse Nails**  
**ARE THE BEST ALL AROUND**

The most perfect in form and finish. Made of the best Swedish Iron. Will hold a shoe longer than any other nail made. Note the re-enforced point—makes it easiest to drive and the safest to use.

**UNION HORSE NAIL CO., CHICAGO, ILL.**

## THE EASY HOOF TRIMMER

**THE BEST TOOL ON EARTH FOR A HORSE SHOER**



**THE EASY HOOF TRIMMER**  
 Price each, \$1.50. By express, prepaid, \$1.75.

**Caution**—Don't make the mistake that a great many do by grinding bevel on one side of blade, but keep the bevel equal on both sides, so that it will pass through the hoof straight and not in a strain.

Follow above directions and you will soon learn to use the best hoof trimmer on earth.

This tool is rightly named because it is **easy** to adjust, **easy** to sharpen and **easy** to convince a horse shoer that it will cut a hoof down easier, quicker and better than any tool he ever saw.

It has a detachable knife that can be removed or replaced in a moment. The knife jaw is adjustable by means of screws. When the knife becomes shorter by sharpening, give the screw a turn or so and the reins will go back to the proper distance apart. When knife wears out we will send you another by mail, postage paid, on receipt of 10 cents.

**Dimensions**—Weight, 2 pounds; length, 12 inches; opens 2 inches; cuts 1 inch.

**Our guarantee**—If you don't like it you can return it and get your money.

**Directions for using:** First—hold the foot in the ordinary manner and remove soft parts from bottom with your toe knife; then with the trimmer begin at the heel and cut down and around the toe and back on the other side, removing the part at one cut and in one piece. Second—avoid all wrenching or prying. Hold the tool as near upright as you can. Cut straight through to the blank jaw regardless of nails or other obstructions and with very little leveling with the knife or rasp, your job is complete.

**MUNCIE WHEEL & JOBBING COMPANY**  
 MUNCIE, INDIANA

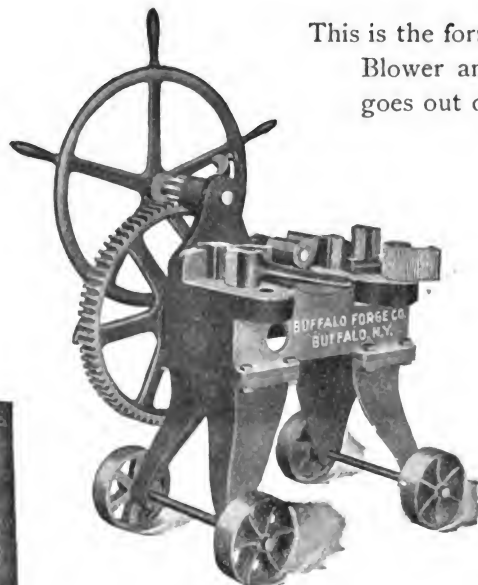




# Buffalo Blacksmith Tools

Buffalo Tire Up-Setter No. 3.

A machine of new design and large capacity. Grips are shod with best forged steel. Upsets tires 7x1 1/4 inches or axles 3 1/2 x 3 1/2 inches.



This is the form of Guarantee that stands back of every No. 200 Blower and every Forge fitted with a No. 200 Blower that goes out of our shops.

Buffalo, N. Y., .....190.....

## Guarantee Certificate

Be it known to every purchaser of a Buffalo Steel-Plate Forge, 600 Series, also to every buyer of a No. 200 Buffalo Geared Blower, that these machines are hereby guaranteed against cost of repairs due to wear, for five years from date of this certificate. Any parts wearing out within five years will be replaced free of charge, f. o. b. cars Buffalo. Mention the date of this certificate and the style of machine.

The Buffalo Geared Blower, No. 200 Series, is also guaranteed to outwear any other on the market, to produce a stronger blast with the same number of turns of the crank per minute, and with less power than any other blower built. Run these machines 24 hours per day if you want to, this guarantee holds.

BUFFALO FORGE COMPANY,

*N. F. Mudd* President.

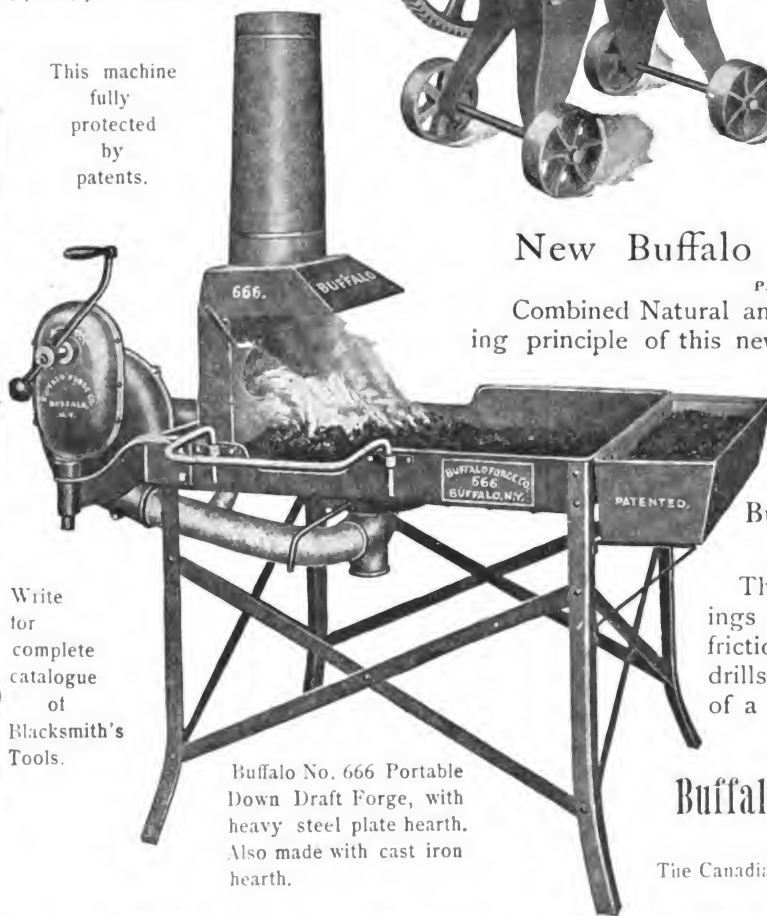
Buffalo, N. Y., U. S. A.



This machine fully protected by patents.



Write for complete catalogue of Blacksmith's Tools.



Buffalo No. 666 Portable Down Draft Forge, with heavy steel plate hearth. Also made with cast iron hearth.

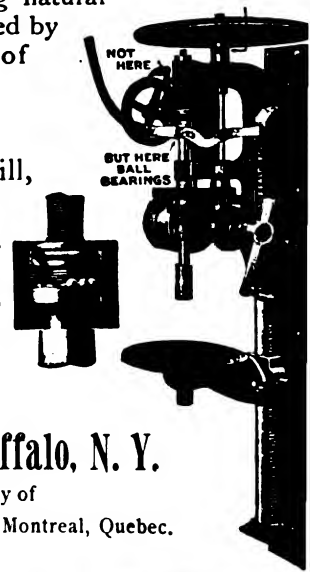
## New Buffalo Down Draft Forge

PATENTED 1905.

Combined Natural and Mechanical Draft is the working principle of this new forge. The full existing natural draft is made use of aided by the exhausting strength of the No. 200 Blower.

## Buffalo Ball Bearing Drill, No. 90.

The proper use of ball bearings in this drill reduces the friction fully one-half. No. 90 drills a 1 3/4 inch hole to center of a 22 inch circle.



## Buffalo Forge Company, Buffalo, N. Y.

Canadian friends; save duty, buy of

The Canadian Buffalo Forge Company, Ltd., Montreal, Quebec.



## Buffalo No. 200 Blower

*Built on Modern Mechanical Principles.*

THESE ARE CUT SPUR OR HELICAL GEARS, with broad heavy teeth. They are not spiral gears which cause friction and soon wear out. They are not spiral gears which get out of alignment, the objectionable feature of all spiral-gear blowers. (Ask your brother smith what he has already paid for repairs and will have to pay within five years.) Any part of a Buffalo No. 200 Blower wearing out in five years will be replaced free of all charge. Note the large proportion of these gears. They are mounted on a heavy cast iron frame, entirely independent of case. They are in a straight line and must run true. Frame prevents any possibility of their getting out of alignment, as the entire mechanism is self-contained. Remove the gear case and the gears run the same as before. The case serves merely to keep out the dust and furnish oil bath. These gears are as accurately cut as those on the finest machine tools. There are no brass boxes to wear out. The cold rolled polished steel shafts run in extra long bearings bored and reamed in a solid casting. The gears run in an oil bath, insuring perfect lubrication for months, without attention. An air-tight, dust-proof case protects the gears and keeps out all dust and grit. This is the only blower where the casing is adjustable for any desired angle of discharge of blast. An air meter or anemometer test shows that this blower delivers more air with less power than any other blower in the world.

## Buffalo Ball Bearing Drill, No. 66.

This drill has our patent spindle head ball bearings the same as No. 90 Drill. It is a smaller machine but just as carefully built and will be found the right size for the average smithy. Drills to center of 15 inch circle.

This is the gearing used on all blowers shown herewith. Replaced free if it wears out in five years.

BALL BEARINGS

"The  
Pride of  
The  
Modern  
Smithy."

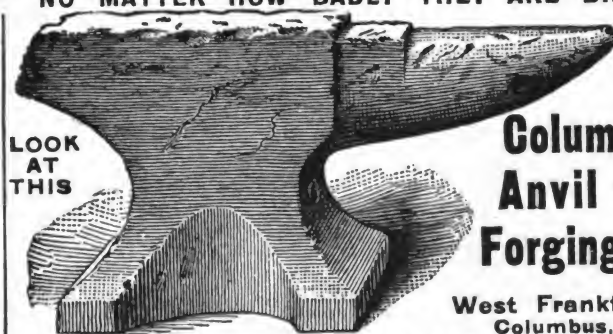
Buffalo No. H. H. Improved Side and Center Blast Tuyere. Three blasts—right, left and center. Complete control of fire. Will not burn out. No clay lining. Offered free with No. 200 Hand Blower to first purchaser in each county, provided he mentions THE AMERICAN BLACKSMITH.

BUFFALO FORCE CO.

BUFFALO, N. Y.

NO MATTER HOW BADLY THEY ARE BROKEN WE CAN REPAIR THEM IN GOOD SHAPE.

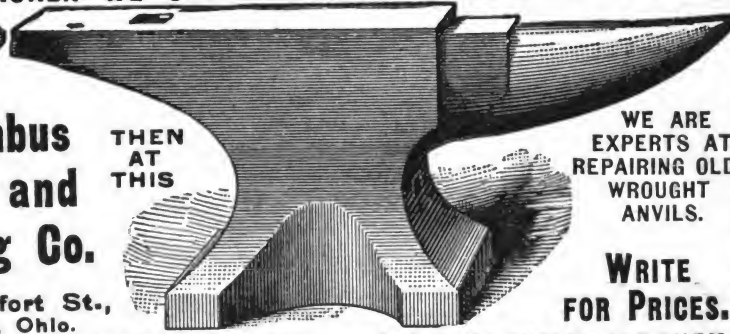
LOOK  
AT  
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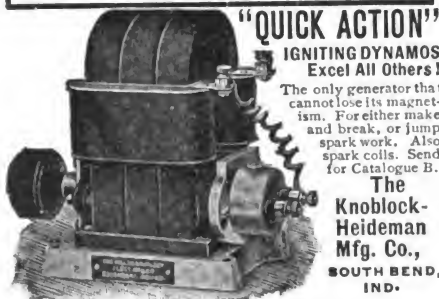
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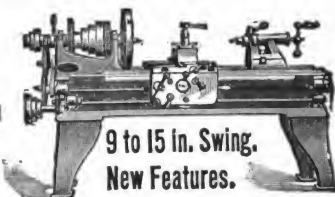
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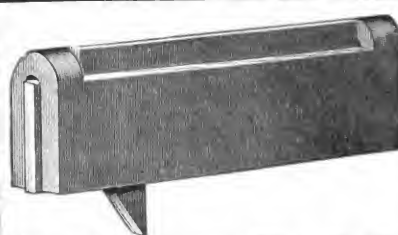


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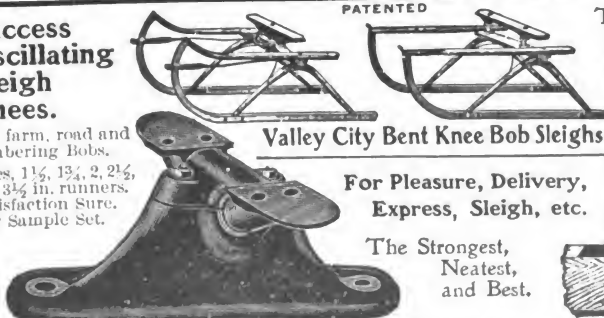
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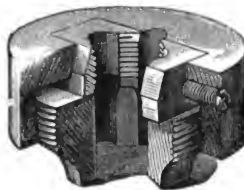
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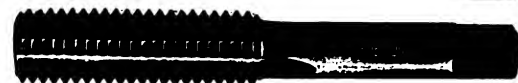
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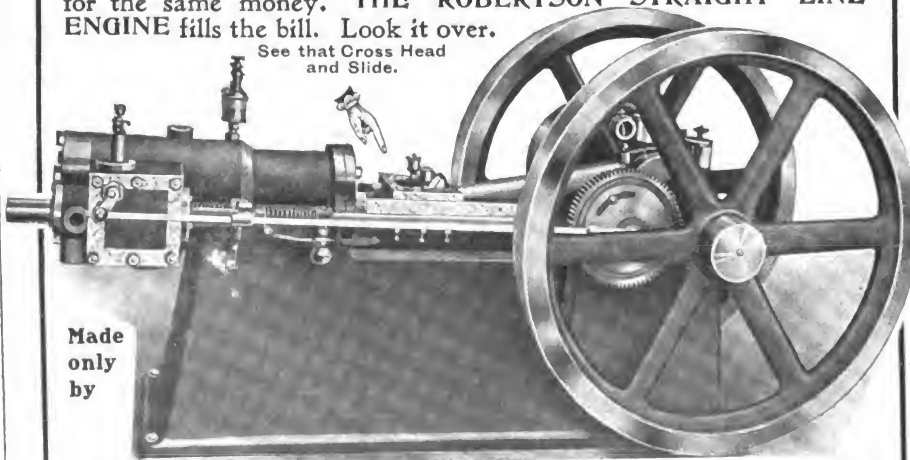
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There are scores of blacksmiths who know that **Morgan & Wright Hoof Pads** help them to hold their pad business because of the satisfaction they give to horseowners.

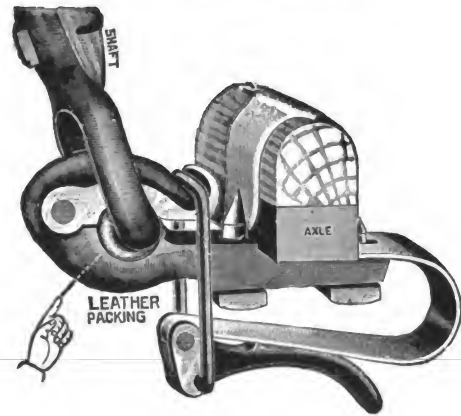
## Do YOU know this?

These are "the pads that help to build up the pad business"

**MORGAN & WRIGHT PADS  
ARE GOOD PADS**

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**NEVER SQUEAKS or SIDE RATTLES**

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**G. C. Bradley & Son**  
SYRACUSE, N. Y.



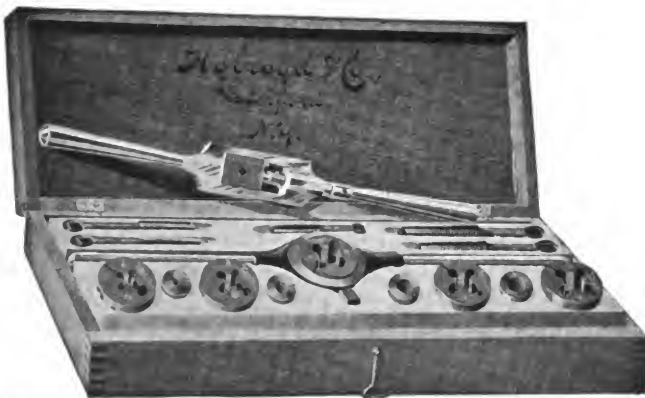
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THE ONLY WAY TO JUDGE THE MERIT of a tire is by the service it gives. The best proof of service is unanimous praise from thousands of consumers. **FIRESTONE TIRES** have an enviable record. Because of their merit they are largest sellers in the world—four to one.

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Canvas Back.  
Heavy.

PATHFINDER.



Canvas Back. Closed  
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High Heel.

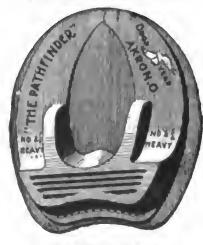
Our pads are the best, because they are correctly made; are made from the best rubber; easy to fit; all are guaranteed.

EASY.



Leather Back.

PATHFINDER HIGH.



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Extra High Heel.

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# THE AMERICAN BLACKSMITH

A Practical Journal of Blacksmithing and Wagonmaking

VOLUME 5

NOVEMBER, 1905

NUMBER 2

BUFFALO, N. Y., U. S. A.

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## Does It Pay?

For several months past, a question concerning the profitability of the paint shop has occupied the minds of our readers, several writers endeavoring to point out the faults in the unprofitable painting department. The opinion of a majority of these writers seems to be that the paint shop does pay if certain conditions are respected. If the head of the shop keeps in close touch with the work. If he knows his business and pays strict attention to it. If he charges for all work executed and does no work which is not paid for. If he insists upon his rights. But, is the paint shop the only department that requires the observance of these conditions, when it is to be made profitable. Will any other branch of the trade — blacksmithing, horse-shoeing or wagon-making — pay if one doesn't work along these lines? The trouble with some smiths running paint shops is that they expect this department to run itself. They don't give it the attention it deserves. They probably figure paint at a certain sum, and time at so much per hour, but they overlook the fact that the painting department should carry a certain ratio of the dead expenses, such as rent and insur-

ance. Then there is the fuel used in heating the paint room, the brushes, the occasional bolt, screw or clip put on the vehicle and the numerous other things incident to every paint shop.

When you decide that a certain department of your business does not pay, investigate. Get an accurate knowledge of the costs. Get right down to cold facts, correct the faults and make it pay. If you cannot afford to keep a helper all the year, lay him off during the dull season. Cut down on expenses. Check all waste. Charge a reasonable price for your work and get your money. Don't ever think that you cannot profitably pursue a business in which someone else is fairly successful.

## Side Lines in the Smith Shop.

We have always encouraged subscribers and readers to carry sidelines, — something that will net them some return for the spare time and slack time which is a part of the usual smith's routine. There are few shops, if any, which could not carry on a sideline with profit. Of course some lines are not especially suited to a given locality. The principal consideration is, to know your customers' wants—to carry on some line which they need. If you are in close touch with your trade this will be an easy matter. Another point is to let your customers, and also those not your customers, know that you carry the sideline. A simple way of doing this is to mention it in your advertising. This should be backed by a neatly printed card or two, hung up in the shop.

The lines which can be profitably taken up by the smiths are almost without number. Among the more common lines we find making butcher knives; sawing wood; wood working and finishing; running vehicle, gas engine, farm implement, wind mill and bicycle agencies; harness making and repairing; horse clipping; bicycle and automobile repairing and dealing in stock food and farm remedies. These lines can be carried on in almost any

locality and are reported from all sections of the country.

Among the more unique lines we find one of our readers furnishing electricity for lighting the village in which he is located; one man in Iowa and another in Kansas maintain each a barber chair in connection with their smith work; two subscribers report an undertaking business; a smith in Illinois has 30 colonies of bees to help sweeten his labors; several others sell coal, while one or two deal in stoves. Several smiths help their farmer customers by selling fertilizer; many deal in feed, and one or two buy and sell junk. Smiths without number repair miscellaneous articles:—stoves, watches, clocks, sewing machines, lawn mowers, musical instruments, guns, and revolvers, finger rings, razors, locks and other things too numerous to mention.

If you carry a sideline that is not mentioned above, let The American Blacksmith know about it. Tell how you started your line and what your methods and success have been. Others will be as interested in what you have done as you are in the side line of your neighbor.

## The Importance of Blacksmithing and a Credit System.

O. W. TAYLOR.

Blacksmithing, by some people and by some smiths, is looked upon as a trade of a minor sort. On the contrary however, it is a trade of the higher class if not the highest and every man who works at the trade should look at it as such. If he does not his trade will very likely not amount to much. To gain the best results in our trade let us think that we are somebody and then also let us prove by our work that we are the somebody we pretend to be. Our work tells just exactly what kind of a machine we are. I do not mean to say that when a customer comes to the shop especially a new one, that we should boast of what we are, what we can do, and how much better we can do it than the other fellow. Let your

work do the talking and I am convinced that we will have more new customers coming our way than the man who boasts with words. I say boast all you can with deeds but not with words.

Some one asks how can we best run our business without losing money. In my mind this is a question each smith can best solve for himself, for he best knows the circumstances of his community. First of all let your customers know that you are working for money and not for glory. Tell them when their bills are due and that if not paid promptly all work done thereafter must be paid for in cash. We have all kind of people to deal with and of course must make our credit accordingly, but never make it longer than a year. By close observation I think the smith can most always tell who is good pay or not. I think it better to be doing nothing than to work for nothing. My way of handling a man who I think is poor pay is like this; if he asks me how much I will charge to do a certain job, I just ask him a dollar or so more than the job is worth, and nine times out of ten he will walk out of the shop. But, in case he allows me to do the job, anyway, I tell him that I have just invested all my cash and that if he can give me a certain amount on the job I can do it for him, letting him know that I pay as I go. This will probably send him away for all time. I have been in business for eight years and have not lost more than three dollars in all that time. Never settle with a man unless you have your books with you, even if you do know his bill. You will avoid many mistakes this way.

#### The Blacksmith Shop at Haskell Institute.

W. D. GALES.

Haskell Institute is situated at Lawrence, Kansas, and is one of the links in Uncle Sam's chain of Indian schools. As in most of the present day schools of this kind, blacksmithing receives its proper amount of attention.

The shop is built of native limestone and has a floor space 48 by 60 feet. It contains eight forges fitted with Western Chief blowers and the necessary anvils and vises, of which there are eight each. Besides we have one Green River Press drill, one cone or mandrel, one swage and one tire shrinker, with the other tools usually found in smith shops.

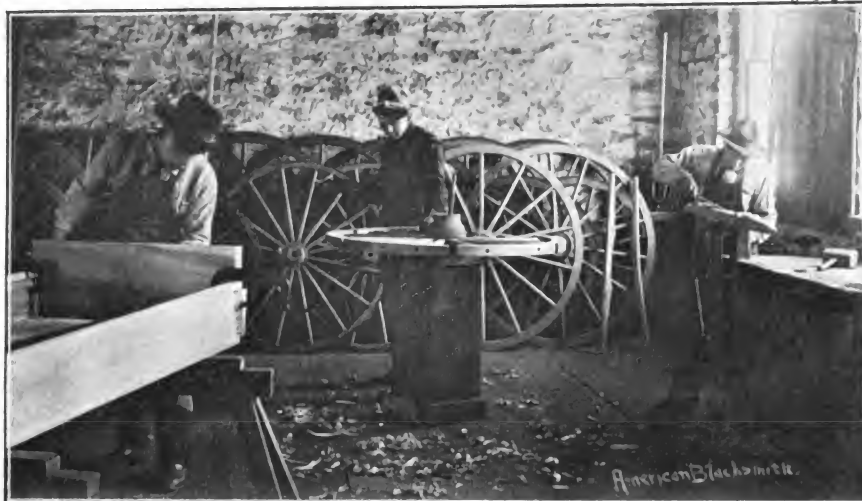
At present, there are sixteen boys (the usual number) working in the shop. These boys are taught to build and care for fires, take care of tools, work iron into different shapes and forms, and

upset and form heads on bolts of any desired shape. They are taught how to weld, get proper heat, and how to treat iron to prevent burning, etc. About 50 farm wagons are ironed annually, besides some spring wagons. All of the iron work on the wagon is made out of bar iron by the Indian boys in this shop. This gives the boys ample practice in all iron work connected with wagons as it includes the setting of tires, ironing of bolsters, hounds, axles and the banding of hubs; also the making of stay chains, clevis, brakes, the ironing of tongues, single and double trees, neck

seasons. Besides this the boys make a great many tools, and are taught the hardening and tempering of steel and the case-hardening of iron.

One hour each day is devoted to talks in the different shops, taking up some point in the work which will enable the student to become more interested and to understand the work that he does more thoroughly than if he were left to simply work his way out hit or miss.

The idea is that every boy shall know just what he is doing, shall know how it should be done, and how to handle himself and tools, and also to know



A CORNER OF THE WAGON DEPARTMENT AT HASKELL INSTITUTE.

yokes, and the ironing of wagon beds or boxes. Then there are the repairs that come in from the farm and from other departments of the institution. These repairs consist of all the wagons, implements and machinery used on a thousand and acre farm, such as plows (the sharpening of which gives the boys practice in that line), cultivators, rakes, harrows, planters and mowers, of which there are several of each, and in season there is hardly a day when there are not some repairs needed on one or the other.

Belonging to the institution are about 40 head of horses and mules that are brought to the smith shop once every month to either have old shoes reset or be reshod with new shoes. The boys are taught how to strip and to prepare the foot to receive shoes, and to nail same into place. They are taught how to treat diseases and defects of the hoof, such as corns, cracked hoofs, contracted hoofs, etc. They are also taught to reshape old shoes, to turn new shoes, make new shoes and shape and put on foot to overcome difficulties in gait, such as interfering, stumbling, forging, knee-knocking, etc. The boys are also taught the difference in shoes for different horses, and purposes and for different

cause and effect of certain conditions. All these things are told and shown him in these daily talks which are illustrated by the actual work. The thought is that when a boy leaves Haskell Institute he will be able to earn a living in competition with the white man.

#### Does The Paint Shop Pay?

H. N. POPE.

Does carriage painting pay? Yes, if the paint shop is properly looked after. In the first place, give your customer only what he pays for and do not throw in a lot of extras just because he is a good fellow. If he is your grocer he does not throw in an extra peck when you ask for a bushel of potatoes, nor does your butcher give you a slice of ham with a roast of beef. You get what you pay for, no more. Why should they expect from you more than they pay for?

If a customer calls and wants an old wagon painted and you agree to give it a coat of color and varnish for three dollars, he usually stays and talks it over for some time. He finds a bolt out here and there and "would it not be better if the rims were leaded first?" Of course it would, but you have given him a price, now let him know that if he



wants to add to the labor he must pay extra for it. If you do not, he will go away thinking the extras are all for the first price. After you get to work at the job you find a spoke broken at the fellow. If the owner can be found without trouble, tell him about it, also let him know what it will cost to put one in. If he is not found, let it go. It was not in the bargain and ten to one he will say he knew it was broken. This kind of work, of course, is not painting, but as there are some men who want this kind of work, give it to them and if rightly handled there is a profit in it. A better class of work is the job that brings from ten to twenty dollars, but I think the same principal applies to both kinds.

Another point to be looked after is stock. A good man will not mix a lot of color which he does not immediately need. It will only dry up and finally be thrown out and when it goes out the dollars go with it. Still another point and one to be handled with care is the help. First, I believe the smith has no

put in good repair and painted. This is all right in itself, but the main point is, he gets his wagon stored. The season has come when he can use his sleigh, so you see no more of him till nearly spring, when he drives up with his sleigh and says he wants a shaft-iron mended. After the job is done it hangs around some days until the owner comes in and asks if his wagon is ready for use. He well knows it is for he has long had your bill for repairs. He looks it over and is satisfied, but makes no move to take it. Finally he asks for an old wagon of yours to use for a day or so till the mud dries up and says "As to the sleigh, hang it up somewhere and I will have it varnished in the fall." His two or three days' use of your wagon has run into as many weeks. Now as you are good, you say nothing, but let him have it, thus losing the sale of the old wagon. In the meantime you are furnishing him with a wagon and at the same time storing both of his vehicles. This is a loop hole through which many a dollar

good terms as the man who pays his accounts promptly each month.

#### The Process of Producing Heller Brothers Files and Rasps.

The making of files and rasps by hand is a very old art and was brought to its highest development by the English and Germans. The manufacture of files and rasps by machinery is comparatively new and the Americans lead the world in both quality and quantity. The machine made files and rasps have practically displaced the hand made ones in this country and in most foreign countries, for the reason that they are cheaper to produce and more uniform in quality. The file and rasp business of this country is practically in the hands of a few manufacturers, who can be counted on the fingers of one's hand, but whose production exceed in quantity and quality the combined production of the several hundred foreign manufacturers. All but two of the American manufacturers buy the steel from which they make their files and rasps. The



A BUSY CORNER OF THE SMITH SHOP AT HASKELL INSTITUTE.

business in the paint shop. If he is the proprietor, let him hire a man who understands the painting. Pay him his wages every week and if he does not fill the bill, let him go, and find another. In other words, let the man who owns the plant run it, not the help. If the rush of painting is over don't keep a lot of extra help, for they will soon eat up the profits in their wages.

There is also another kind of customer to look out for. This one will bring in a job late in the fall and say he wants it

slips. The man is fairly good pay, but the point is, he gets more than he pays for. You have to pay rent and if not, you should get interest on the capital invested, so it would not be unfair to charge storage for a job held too long.

Another point; be careful to collect, do not be afraid to send a bill or to call in person. You have done the work and it is no more than fair to get your pay. You have your bills to meet and if they are not paid promptly, your credit is not good and you cannot get as

necessity of using a uniform high grade crucible steel from which to produce superior quality goods has induced Heller Brothers Company of Newark, N. J., to manufacture their own steel. This company is a very old one, having been established in 1836.

The best grade of files and rasps are made from crucible steel, which is melted in small crucibles, holding about 100 pounds of metal. After being thoroughly melted the steel is poured from the crucible into iron moulds forming

an ingot. These ingots, being about 4 inches square and about 3 feet long are reheated and hammered under a steam hammer to a smaller size, called a billet and then rolled in long bars to the exact width and thickness of the file or rasp to be made from the bar. The bars are now ready to go from the steel works to the file works, and the first process in the file works is to cut the bars into small lengths, the size of the file or rasp to be produced. These pieces are then forged under power hammers, see Fig. 1, and rolls, thus pro-

with a bright smooth surface, ready for the cutting department. The cutting is done by machine shown in Fig. 2.

A file differs from a rasp in having its teeth cut with a chisel whose straight edge extends across its surface, while the teeth of the rasp are formed by solitary indentations of a pointed chisel.

There are single and double cut files. The former has only one cut and the latter two cuts, one crossing the other. The first cut is called the over-cut and the second cut is called the cross cut. The coarseness or fineness of the cut is

edges. They are heated in a hot lead bath to a cherry red color, and then immersed in salt water, after which they are straightened. They are then cleaned by being submitted to a wet sand blast, which not only thoroughly cleans them, but also removes the very fine fin on the extreme points of the cutting edges, thus leaving a solid sharp cutting edge. From the sand blast machine they are dried and then oiled to prevent rusting, after which they go to the testing department and the imperfect files are culled from the perfect ones. The perfect ones are then prepared for shipping, by being packed a dozen in a card board box and labeled with name, size, kind and cut.

### A Few Stray Thoughts.

L. VAN DOREN.

In my opinion every blacksmith should be a subscriber to *THE AMERICAN BLACKSMITH*. One man said there are too many foolish things in it. I told him he should write for the journal and fix such fellows right. He answered, "If I knew a good trick, do you suppose I would give it to the craft by having it put in a trade journal? Not much." It is hardly necessary to say, that that fellow was not an American. There is scarcely a number of *THE AMERICAN BLACKSMITH* that is not worth the year's subscription. While it may be true there are some articles in it we don't fully endorse, there are articles by experts which, together with the new tools advertised, make the dollar for twelve issues look very small to an enterprising blacksmith. In this age of improvements we must try to keep up or we are sure to get run over. The writer worked at the anvil several years before he could buy ready-made horse shoes or horse nails. Some of the first farm wagons we ironed were the old fashioned lynch pin axles and every bolt, nail and rivet used in them was made by hand. If every one would keep his new ideas secret this world would move very slowly. My father said he could remember when a farmer, who was able to own a wagon that had spokes in the wheels was regarded as being financially above the average. I suppose just about as those who ride in automobiles are regarded today.

The writer has had to give up the manufacture of carriages as we could not compete with system and machinery. But we submitted without a murmur, believing a greater number are benefitted than under the old system. Toleration is my hobby. I think it should be our chief attribute and watchword, never

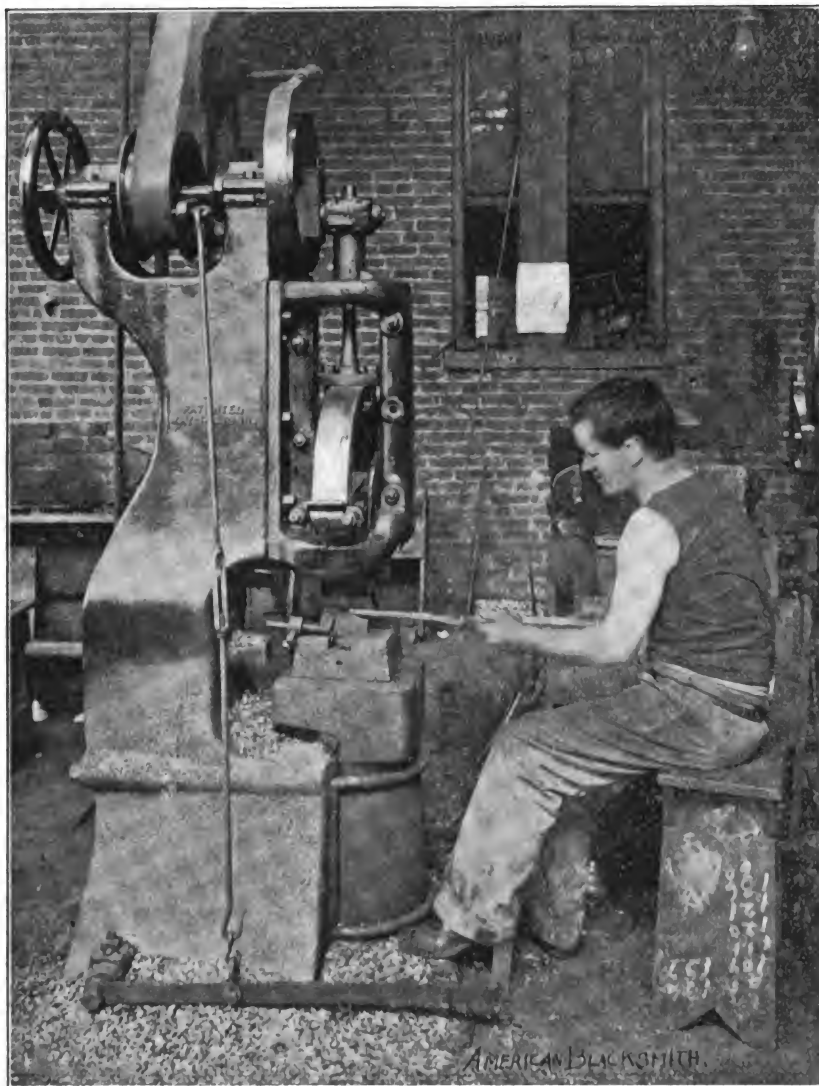


Fig. 1.—SHOWING POWER FORGING HAMMER.

ducing a complete file or rasp blank with tang on one end and point on the opposite end. These blanks are then taken to the annealing department and annealed in large furnaces, so that the blanks become soft enough to enable the cutter to raise sharp teeth on the surface of the blanks. They are then straightened and taken to the grinding department, where they are ground by machinery, thus removing the black annealing scale and leaving the blanks

designated by the following names:—rough cut, bastard cut, second cut, smooth cut and dead smooth cut. Dead smooth cut is the finest cut and each cut increases proportionally in coarseness until the rough cut is reached. The coarseness of the cut increases or diminishes in proportion to the size of the file. After the blanks are properly cut they are prepared for hardening by being coated with a paste to prevent the heat of the fire injuring the fine cutting

forgetting others' rights. I am not quite ready to condemn those houses who send their catalogues broadcast over the country, as I can't see any crime in soliciting trade from any one legitimately. I am highly in favor of every mechanic and professor being required to secure a license before he is permitted to do business for the public, in order to protect the public from being imposed upon. I believe in all the liberty possible so long as it doesn't conflict with the rights of others, hence my objections to trade and labor unions. There must be something wrong with the mechanic who is forced to reduce his prices below what they should be in order to hold his custom. There is a great difference in mechanics. To illustrate, Mr. A can do the same class and amount of work in half the time it will take Mr. B to do it. Now I claim Mr. A has a perfect right under our rules and laws of competition to put the price on such work so that Mr. B must seek other fields.

#### How I Bound My Copies of The American Blacksmith.

A. J. PANTON.

I have been a subscriber to your paper ever since the first issue, and have all the papers now bound in volumes, in the following simple way. I made two copper wire staples for each volume out of No. 16 wire and long enough to reach through the volume with half an inch to clinch. I then piled the papers neatly together, fastened them with a clamp and with a long awl bored four holes through the back margin of the paper. Into these I inserted the staples and then clinched them tightly. This makes a snug volume of useful information. I sometimes get information out of a single paper that is worth more to me than the cost of several years subscription.

#### Paint Shop Troubles. Prevention and Remedy.

M. E. HILICK.

The carriage and wagon painters in the small shops throughout the country, for whose benefit these articles are chiefly intended, find their greatest annoyances to arise from the use of paint and varnish. Not infrequently these annoyances occur during what we term the cold months of the year—when the ills to which the small shops are heir to, are in their best state of development. High winds, chilly atmosphere and dampness invade the small and, as a rule, inadequately tight and warm shop, or collectively, are hard to control.

High winds play havoc with newly varnished work in shops that are not proof against these disorders, and while prevention may be preached as the only sure cure for the results so often due to heavy winds, it is more often than not the case that absolute or even partial prevention is quite out of the reach of the average country or small shop painter. Hence he must turn to curative remedies to overcome the results wrought by the piping breezes. It seems hardly

Having provided to the extent of his ability against these difficulties, the painter is compelled to next turn his attention to remedying the results arising therefrom. Seedy or specky varnish the supreme condemnation of the finish, come very often directly from hard blowing winds following the application of the varnish. Varnish of the more sensitive grades sometimes spots by reason of disturbing currents of air beating upon it during the setting

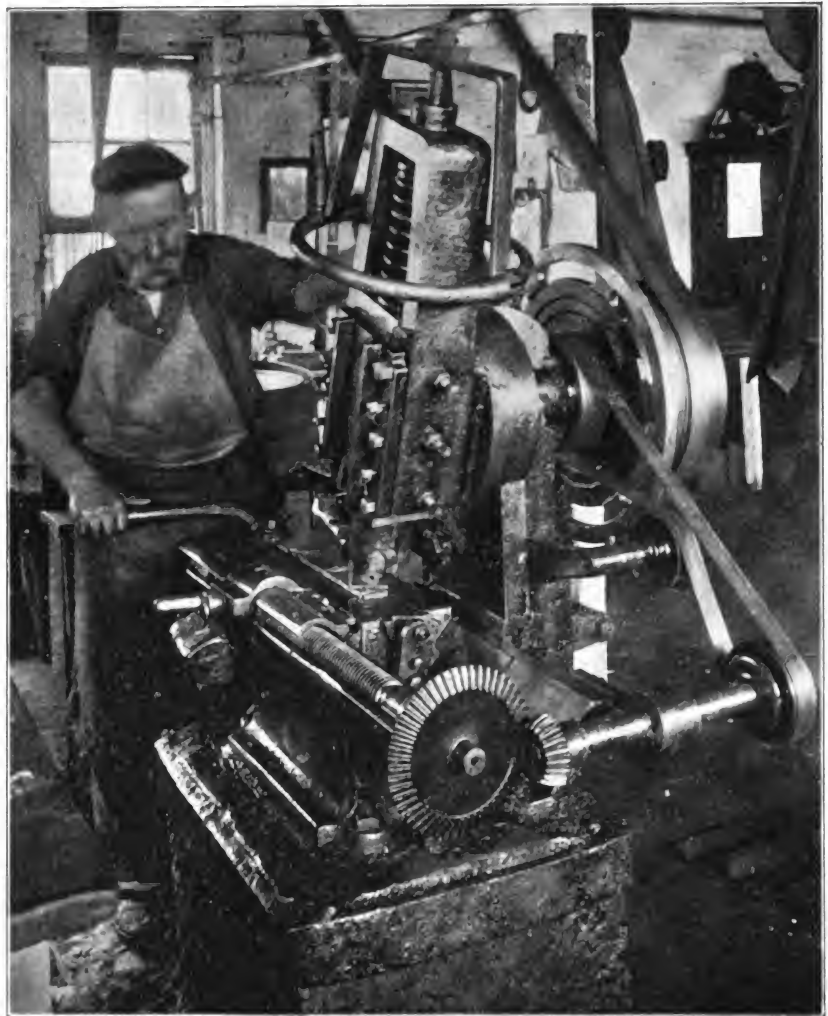


Fig. 2.—SHOWING POWER CUTTING MACHINE.

necessary to call the paint shop readers of the AMERICAN BLACKSMITH to give their attention to making the paint shop, and, above all, the varnish room as tight and dust proof as possible. This may figure chiefly as a matter of prevention, but it may likewise be regarded as a remedy and after all it does not affect the situation either way by quibbling over the titles most appropriate to describe measures of safety. Doors and windows, not to lose sight of loose siding and gaping wall fissures, need to be stopped and made secure against the entrance of vagrant winds and the misfortunes which they bring.

process—the period during which the varnish is hardening free from dust. Once the varnish goes dirty or spotty the jobs should be set aside, and in an apartment maintained at a uniform drying heat, allowed to harden to a condition that permits the varnish to be rubbed with water and No. 00 pulverized pumice stone. This rubbing had best be divided so as to cover rubbing two or three separate days. As for example, the first rubbing may consist in getting the gloss well off and wearing down the nibs of dirt somewhat. The day following, again rub the surface using for the large panels  $\frac{1}{4}$ -inch felt pads

or heavy felt drawn tight over a block of wood. If the surface is not too seedy this second rubbing should suffice to bring the varnish down to a level over which the next coat of varnish, if flowed on, will shine forth with depth and brilliancy. If a bad condition of seedy varnish exists a third rubbing will be required. These successive days of rubbing are for the purpose of leveling the surface without tearing up and permanently defacing the varnish film. If rubbed carefully and set a-

ment. In case the varnish is found in this condition lay a couple of bricks upon the stove, and on these bricks set the can of defective varnish, heating the contents gradually until a perfect union of all the ingredients is consummated. To prevent varnish from chilling, store it well up on the shelves in a uniformly warm and dry part of the shop, and purchase your supply well in advance of cold weather so that chilling in shipment may be obviated.

The graining out of a finished surface

cause, as investigations in the city trade have disclosed, being probably responsible for more recent cases of graining-out than any other. While it is possible to rub down, recolor, and finish a surface that has by common consent grained out, the only sure cure is to burn the paint from the surface, sand-paper carefully, lay on the lead coats desired, and then roughstuff and rub down after the customary practice. Granting the wood to be perfectly seasoned, the key to the situation lies

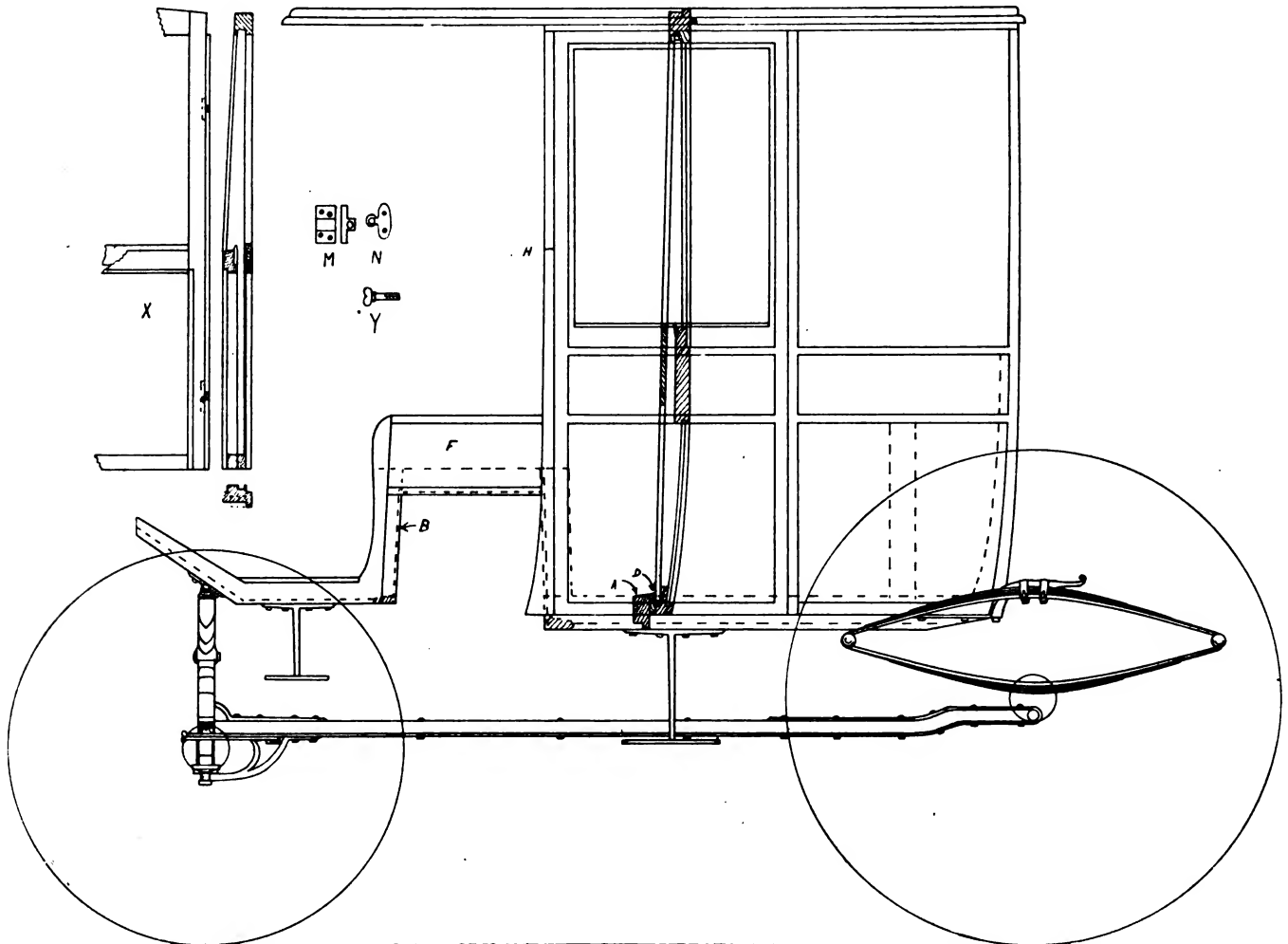


Fig. 2.—SHOWING SIDE ELEVATION OF CURTAINED DEPOT WAGON.

side in a warm room the varnish dries much more rapidly, which is the warrant for the repeated rubbing. In case the varnish spots from the draughts of wind a single rubbing, once the varnish is dry, will furnish a proper surface to again finish over. Specky or seedy varnish is not always due, to be sure, to high winds or to certain conditions of the atmosphere. It very often comes from a chilled varnish, which denotes a varnish in which the oil and the driers have separated. During cold weather a varnish may chill sitting upon the shelves in a cold part of the shop, and it not infrequently chills during ship-

ment. In case the varnish is found in this condition lay a couple of bricks upon the stove, and on these bricks set the can of defective varnish, heating the contents gradually until a perfect union of all the ingredients is consummated. To prevent varnish from chilling, store it well up on the shelves in a uniformly warm and dry part of the shop, and purchase your supply well in advance of cold weather so that chilling in shipment may be obviated. The graining out of a finished surface

in applying a sufficient body of roughstuff-four, five, and even six coats, as the condition of the surface suggests-to enable a perfectly level surface to be produced by rubbing with lump pumice stone or prepared rubbing brick, without stripping the wood of its necessary protective pigment. Lack of roughstuff coats, or because of coats poorly applied, develops the graining out so destructive to the permanency and good looks of the finish.

In the small shop where ordinary coal stoves are the mediums for heating the shop we find no small trouble ensuing during the cold months from



sweating of the surface before it is finished. For instance, the surface of rubbing varnish rubbed out with pulverized pumice stone and water, and allowed to stand over night in the average paint shop in which gases from the stove and from the various poisons present in the apartment, envelop the work, will take on a certain greasy scum over which, if applied, the finish would have a sorry show. This trouble may be overcome, or rather prevented by simply rubbing the surface the day before revarnishing then standing aside overnight, and again rubbing the varnish lightly before finishing.

Another trouble which we hear and see much of during recent years may be called "Greening"—that is to say, the development of a peculiar shade of

color over another not thoroughly hard, and often by the air in the room containing the varnished work becoming chilled shortly after the application of the finishing coat of varnish. In the small shop where a stove is depended upon to furnish the necessary heat great care must be exercised in guarding against this particular form of varnish room deviltry. Permitting the surface to harden sufficiently, and then rubbing with pulverized pumice stone and water, and re-finishing, is the remedy applied to this trouble. The cracking and fissuring of paint and varnish is a natural result of wear and tear, and with this we have no fault to find. With the premature cracking, the splitting of the surface into an infinite number of parts, the painter is

surface may be brought to a proper finish in the usual way.

### Working Plans for Curtained Depot Wagon.

J. LAWRENCE HILL.

The various illustrations show a wagon suitable for summer use, it is of an accepted and generally used design, being both inexpensive to make and to keep up. It is very light, can easily be drawn by one horse and answers all the requirements of a buggy, with many advantages added.

The rockers are framed up square and straight, this construction is not only easy, but makes a stronger job, as the strain is vertical through a vertical rocker. But if the rocker is inclined, it has to be made heavier to compensate for the loss of strength due

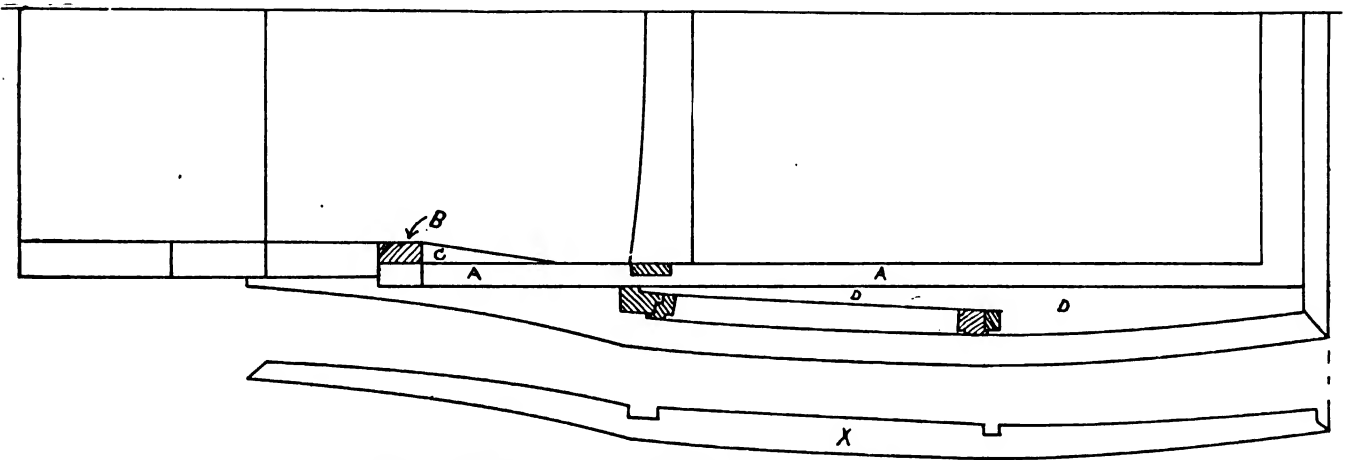


Fig. 2.—SHOWING HALF-PLAN OF DEPOT WAGON AND PARTS IN DETAIL.

green in the finishing coat. This trouble is due, for the most part, to successive coats of clear rubbing or finishing varnish, although it is often developed by enveloping the job with some cloth covering for a protracted period. Constant storage in a dark apartment will cause greening of the surface. For a black surface a little color used in each successive coat of rubbing varnish will hold the surface to its original color. Greening is a common trouble, but the method of prevention is so simple that there is no apparent excuse for its prevalence. To cure a job of greening rub the varnish with pulverized pumice stone and water, and then either apply a coat of black japan or a coat of rubbing varnish in which a little ivory black has been stirred. Then finish in the usual way.

Fire checks describes the condition of a finished surface which shows minute fissures running in every direction over the surface forming squares, circles, angles and triangles. These are caused by applying a coat of paint or

more personally concerned. Forcing one coat of paint over another, before the first coat has thoroughly dried, resulting in a number of coatings imperfectly dried, unseasoned wood, sudden atmospheric changes during the painting and finishing operations, beside many minor inconsistencies, are the causes for premature cracking. Force cracks usually found over the steps on the carriage body, on the seat riser, and on the panel directly under the seat riser, are caused by the vibration and unusual strain imposed upon such parts. These latter cracks the painter is in no wise responsible for. Premature cracking of the surface he is in part, at least, responsible for, and the method of prevention immediately suggests itself to all. If the cracks are not deep they may be temporarily effaced by rubbing the surface and revarnishing. To remove them altogether, apply successive applications of ammonia until the varnish is removed to the color, after which with a fresh coat of color the

to the inclination. The rocker will be seen in Fig. 1, the side elevation by the dotted lines, also by a sectional view shown in the doorway at A. The front leg of the rocker B. Fig. 1 and Fig. 5 is lapped alongside of the rocker at the top of the arch. This is shown in plan A B C Fig. 2, C being a wedge placed in for the rocker plate to lay on. The rocker B can be inclined and lapped into A, but it is more work and really not as strong. When this rocker is together, the blacksmith can fit on the plates, the body maker constructing the sides, which are made independent of the rockers.

The bottom side is shown at D Figs. 1 and 2. To this are fastened the pillars. The panel is then put in and the top rail put on. It is then glued on to the rocker and securely screwed.

The piece E Fig 5 is fitted and glued. Then the panel F is let into the front pillar half an inch and then the Stanhope pillar is fastened against F and B with a half lap into the toe bracket. Now put the plates on screwing them securely to the rockers.

In Fig. 1 a section of the door is shown. This represents the amount of turn under, which is  $1\frac{1}{4}$  inches. The

plate M is threaded and is let into the sides of the front as shown by dotted lines at X. The bolt Y is

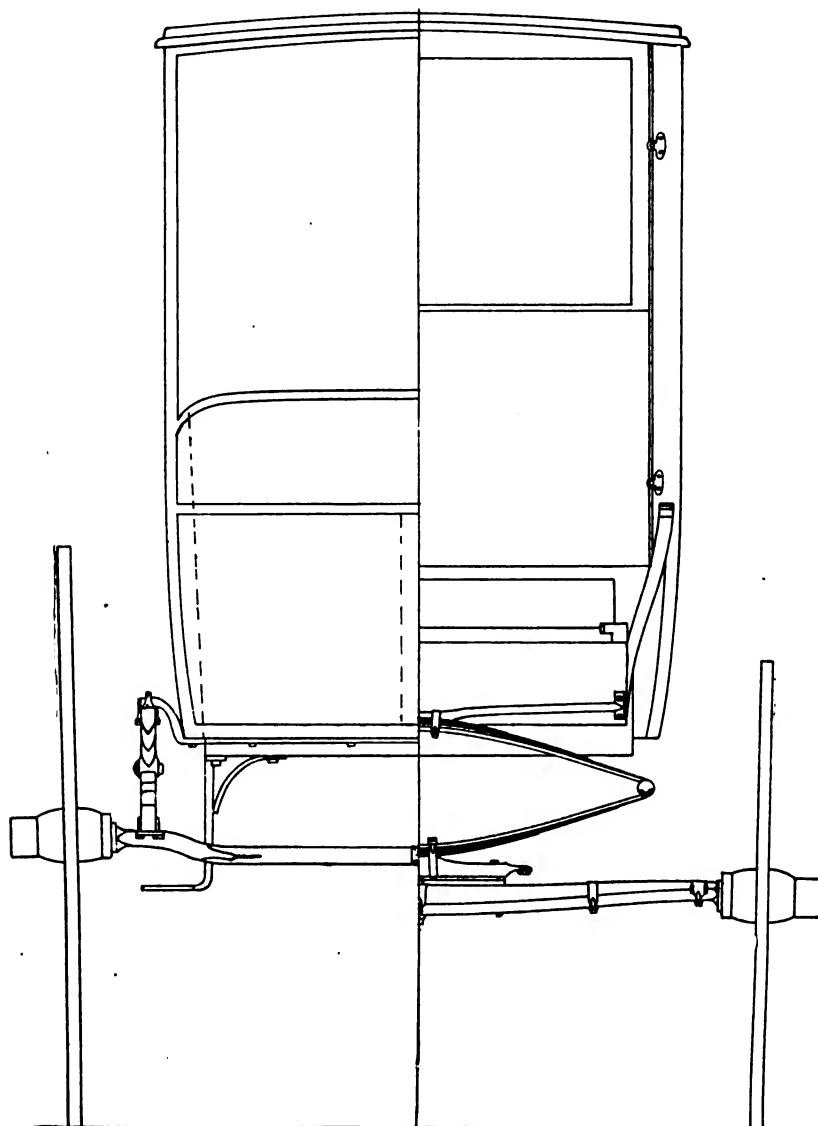


Fig. 3—SHOWING HALF BACK ELEVATION

door pillars are  $2\frac{1}{4}$  inches thick at the lock,  $1\frac{1}{4}$  inches at the bottom, and 2 inches at the top. At Fig. 5 Y shows the method of fitting the back corner pillar to the bottom side. A number 16 screw put from the underside will keep the two together.

Fig. 3 shows the rear elevation and the relation which the wheels, springs and body have to each other. The rear axle is cranked  $1\frac{1}{4}$  inches down. The track is 4 feet 8 inches out to out, front and back. Fig. 4 which represents the half front elevation and shows how the Stanhope pillar looks in relation to the coupe pillar.

The division front is shown at X Fig. 1 with its fixtures at Y, the one window which drops. This front can be easily removed by loosening the 4 wing bolts shown at Y. The

screwed to the face of the front of coupe pillars.

The half plan Fig. 2 shows the side sweep, bottom of the doors, and the bend in the wheel house panel. This is to enable the wheel to turn round until it strikes the reach. The top rail in plan is shown at X Fig. 2. The pillars are merely checked into it from the inside. This is one of the instances which show simplicity of construction.

To the uninitiated the coupe pillar will be a rather difficult one to get out. At Fig 5, X is designed to afford an insight into a section at H Fig. 1. The rabbet on the side is on a bevel to allow for the arc of a circle described by the opening of the door. The inside rabbet is for the division front, which shows that the front is placed in position from the inside.

The front suspension is shown in Fig. 4 to consist of the regulation end elliptic spring, but with an iron span bar connecting the top of spring with the body, instead of the wood spring-bar. The front spring is  $1\frac{1}{4}$  inches by 4 plates by 37 by 9 inches opening. The back springs are  $1\frac{1}{4}$  inches by 4 plates by 35 by 8 inches opening. These are  $45\frac{1}{2}$  inches apart on the axle out to out. Spokes  $1\frac{1}{4}$  inches; front axle  $1\frac{1}{2}$  by  $6\frac{1}{2}$ ; back axle  $1\frac{1}{2}$  by  $6\frac{1}{2}$  half patent; hubs  $6\frac{1}{2}$  by  $4\frac{1}{4}$ . Wheels, wood hub 2 feet 10 inches and 3 feet 8 inches without the tires; tire  $1\frac{1}{2}$  rubber. The width of the door is 22 inches, and the back quarter the same. From the coupe pillar to the dash is 40 inches. The width across the top rail at front is 36 inches; across at the coupe pillars is 42 inches; across at the hinge pillars 45 inches, and at the back 41 inches. The back seat is  $13\frac{1}{2}$  inches above the bottom, with a bevel backwards of  $\frac{1}{4}$  inch down. Two cross pieces, one on the back of the hinge pillars, and the other across the front of the back corner pillars are used to rest the seat boards on.

For painting, a good color is dark green throughout, with body mountings black. The gear is to be striped with one  $\frac{1}{4}$ -inch and 2 fine lines of gold. Trimming to be of green cloth. The roof inside of the division front to be tufted and over the drivers seat painted black and varnished.

### The Value of Power. 2.

H. N. POPE.

To illustrate my point a little more fully, Mr. A. and Mr. B. have a broken tire that is not worth repairing; both must take a load to the market so they

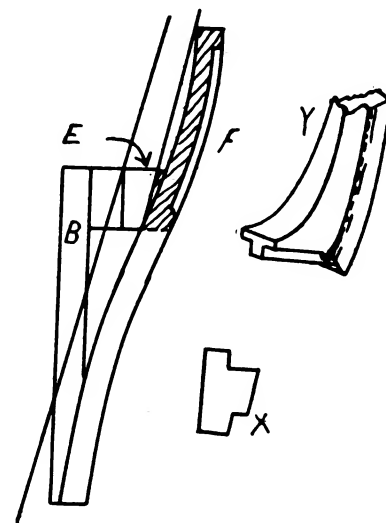


Fig. 5—SHOWING DETAILS OF CONSTRUCTION.

take the wheel off and start for the shop, Mr. A. calls on Mr. Smith and

Mr. B. on Mr. Jones. Smith takes off the old tire, measures it for the new and bends it into shape, starts up his engine which is connected to his blower and the tire is soon welded and put on. The boy takes it to the drill, starts it up and soon has it finished and Mr. A. goes on his way happy. Meanwhile how has Mr. Jones progressed. He has gone through the same process but with no power. No blower to make a hot fire excepting the old hand blower which is very much slower. Finally the tire is welded and given to the boy to drill. He lays it on the old fashioned drill and commences to turn

ing shop. Mr. A. and Mr. B. have wagons of the same pattern. Having run them some time the front axles break taking the beds with them. Mr. A. goes to Mr. Smith, who takes out the axle and gives the bed to his wood-worker who selects a piece of good hard wood, marks the pattern of the broken bed on it and takes it to the band saw to cut it out. Then he runs it through the planer, places it on the pattern and runs it up against his shaper. He then gives it to Mr. Smith, who in the meanwhile has put the axle together. Mr. Smith fits and sets the axle and returns the bed to the wood-worker who

and makes a fairly good job when done. But see the time it has taken to do it besides the hand work.

Mr. B. meets A. at the general store on his way home and asks A. how it is that he always gets his repairs made so quickly when it always takes B. most of the fore-noon. "I always go to Mr. Jones and you know he is considered the best workman in town", says B. Then Mr. A. tells B. how Mr. Smith has just purchased a lot of new machinery and a gasoline engine that does the work in just about one-third of the time it takes to do it by hand. Mr. B. finally says that he is going to tell Mr. Jones

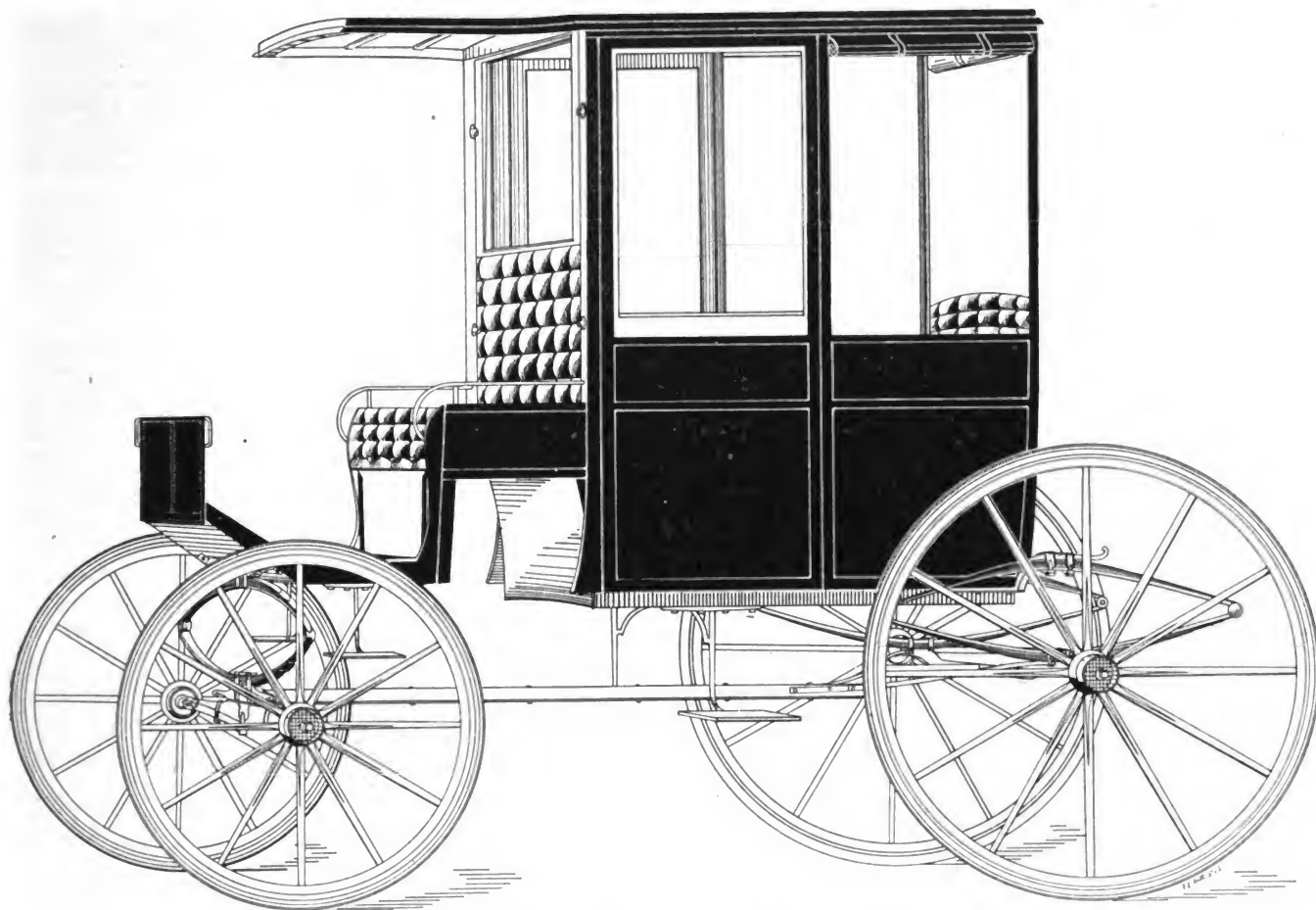


Fig. 6—SHOWING PERSPECTIVE OF FINISHED DEPOT WAGON.

the crank. After a few minutes grinding one hole is through but Mr. B. thinks that the boy is not going fast enough so he grabs hold and at the first turn of the crank snap goes the drill. So Mr. Jones is called from his breakfast to repair a broken drill. The boy forgets to take out the broken part of the last drill so on the first turn of the handel snap goes the second drill. The process of repairing the drill is gone through again and after a while the job is completed. So while Mr. B. is starting for the market, Mr. A. has started on his homeward journey.

Another example in the wood-work-

rounds it up with his draw knife. Then he runs it over the sand belt where it is quickly finished. It is clipped on and put in place. In the meantime Mr. B. goes to Mr. Jones. The axle is taken out and the bed given to the wood-worker. He is fortunate to find the plank from which the bed had been taken out before. He then takes it to the vise, saws it as near the marks as he can and then takes a hand ax, comes as close to the marks as he can and then back in the vise with a draw knife and hand plane gets it into some sort of shape. It is then rounder up, with the file and a sheet of sand paper

that he has either got to get some new machinery or lose a lot of trade. "I had to sell my load at a discount both of the mornings I waited for repairs and Mr. Jones will need to keep up with the times to hold my trade."

Power is directly responsible for a vast amount of trade and the smith without a gas engine must certainly lose trade to his competitor who has a more modern equipment. Even a poor mechanic, if he has power in his shop, will be patronized in preference to a better workman who still continues to do his work by the old, slow, back-breaking methods. If you have work sufficient for an engine then get one. If you haven't work enough now for an engine, you will have when you do get one.

## Blacksmithing in Rhyme.

DAVID GORRIE.

Our trade is so ancient we scarcely can trace  
The time it began, or even the place,  
But from writ that is holy, we this much  
can gain,  
That the first of all smiths was named  
Tubal Cain.

Now Tubal we know was a man of much  
skill,  
The trade was his own, and he wrought  
with a will,  
When he made a poor job, he never got  
fired,  
As no other smith in his place could be hired.  
In the trade many changes have been since  
his time,  
While I think now of some, I will note them  
in rhyme.

The first to which your attention I'd call  
Is Nasmyth's steam hammer, the greatest  
of all.

Fifty years it has held in the forge and  
the mill,

The place undisputed he meant it to fill,  
But it sounds so familiar to all, more or less,  
Ere long will be silenced by the hydraulic  
press.

Then there's work to be done, both crooked  
and twisted

Which in bending and throwing very often  
gets bursted,

Such jobs to the smith oft proved a poser  
But now they are done with a William's  
Bulldozer.

Another invasion our trade has sustained,  
This forging by drop, us sorely has maimed.

Whenever they consider our methods are  
slow,

They take to the drop and forge with a blow.  
Then there's castings of steel, of which I  
must say,

They have robbed us of labor and lessened  
our pay,

What went to be forgings of No. 1 brand,  
Are now turned out by the ton in the sand.

If this picture I've drawn has made you  
feel blue,

Pray pick up your courage and start out  
anew,

You'll find other means to earn a square  
meal,

Just pick up your grip and go selling steel.

Take care of your account books and  
they will take care of you.

The price cutting smith is like a man at an  
auction bidding against himself.

The more we know the greater our world  
and the greater we are in the world.

At least one chance for additional profit  
should suggest itself to you on page 21.

Increase your ability by demanding more  
of yourself than you can accomplish.

Who supplies the automobilist with gas-  
oline in your locality? Why not you?

Obedience is the first great lesson. The  
second is to keep it from becoming slavery.

The story of why certain men are success-  
ful lies within the men and can never be  
told.

Don't discard the trade catalogues that  
come your way. Peruse, profit and pre-  
serve.

The successful man looks upon no detail  
of his work as too trifling for his best  
efforts.

Like a window, imagination, if too large  
weakens the wall and lets the light in to  
hurtful excess.

President Lincoln once said, "Pluck  
a weed and plant a flower wherever you  
think a flower should grow."

Profitably employ your spare time with  
some side-line. There is no excuse for  
idleness during working hours.

Swifter is the pace in these modern days.  
The friendly pipe and neighborly chat must  
wait until the days work is done.

Paying agencies are offered to readers  
by many advertisers in our columns.  
Investigate their propositions.

When a man argues a question of honesty  
with himself, he is not in danger of falling  
into error but has already fallen.

Let us hear how you solve the shop light-  
ing question. This is of no little importance  
during the months when the days are short.

The detachable collar now generally worn  
by men was thought out by a blacksmith's  
wife, who first made it to tie with strings.

Steel tools that date back to 1500 B. C.  
have been found in India. The working  
of steel is not as recent as might be sup-  
posed.

The season of bursted water jackets  
will soon be with us. Anticipate serious  
trouble by using chloride of lime in the  
water.

The modern smith never need fix his tools  
before starting on a job. His equipment  
is always ready and right down to the  
minute.

Quite a factor in these days of hustle is  
the well arranged, well equipped shop.  
How is your shop? Send us a photograph  
or plan of it.

A winning combination for improving  
your practical knowledge of the craft—the  
long winter evenings and our practical  
craft books.

Do you thoroughly investigate when a  
customer kicks? All men are not chronic  
fault-finders. May not the smith be in  
error sometimes?

Urge your customers to bring in their  
sleighs early, to avoid the rush. And by  
the way, are the prospects for winter trade  
good in your locality?

A rubber stamp bearing your name  
finds innumerable uses in your office.  
You can get one with an inking pad by  
sending in a new subscriber.

That man who omits to keep an accurate  
and complete record of every single ex-  
penditure has painted the first letter of a  
"Failure" sign for his business.

A certain Smith we know of lets his  
wife cut all the kindling wood and shovel  
all the snow of winters. So awfully busy,  
he says. His first name is Tom.

No business attains its full possibilities  
until it has been judiciously advertised  
for years, and then the record for one year  
never equals the possibilities for the next.

The many uprisings for cleaner city  
governments is of gratifying strength.  
We are sure the vote of AMERICAN BLACK-  
SMITH readers, will be for honest officials in  
every case.

Lest ye forget permit this reminder that  
you can save money when renewing your  
subscription by taking advantage of the  
long time rates; two years, \$1.60; three  
years, \$2.00; four years, \$2.50; five years,  
\$3.00.

Probably at no time in the history of the  
craft were iron and steel workers held in  
such high esteem as in the sixteenth century.  
Children of millers, barbers and clerks  
were not eligible to learn the smithing  
trades.

Let the bills, the statements and letters  
which are sent from your shop always be  
neat and business like. It pays, even  
from a money standpoint. And by all  
means, do have attractive printed sta-  
tionery.

A hundred years ago, but little more,  
eight bags of cotton were seized at Liverpool  
on the ground that such a great amount  
could not be grown in uncle Sam's domain.  
Last year the cotton crop amounted to  
12,162,000 bales.

Three billion dollars is estimated as the  
value of this year's crops on American  
farms. The smith should come in for his  
share of this immense sum. Make the  
farmers pay up all they owe, now, while  
their purses are full.

When asked why even competitors like  
him, Thorton said, "I speak to them as a  
friend and not as an enemy, don't belittle  
their work to myself or others and, what  
undoubtedly started the kindly feeling,  
I started our organization."

Shop for sale? A helper, secondhand  
tools or a new stand wanted? One of the  
25,000 craftsman reading our "Wanted"  
and "For Sale" column every month may  
be just the man to supply your wants.  
There's nothing better than such an ad to  
find him.

Uncle Sam has exported 22,000 tons  
of copper to China this year. This vast  
quantity will be used in the Celestial Em-  
pire for a new coinage which has become  
necessary because much of the older cur-  
rency has been gradually melted up to  
make cartridges.

Pink Buffalo stamps, don't allow your  
supply to run out. When you find you  
are low, send for another batch. We  
have a big stock. Always glad to forward  
new lots free to subscribers. Use these  
stamps freely in your correspondence, they  
stand for fair treatment.

When a victorious nation makes such  
gigantic concessions, for the sake of peace,  
as has Japan, it may be considered as an  
example by every smith in the country to  
forget his petty jealousies and smoke the  
pipe of peace with his brother craftsmen  
in behalf of harmony, organization and  
better prices.

Now then, friend subscriber, have you  
lent us a helping hand in making the paper  
better by securing any new readers? Many  
have done so, but have you? One of the  
rewards we offer is to extend your sub-  
scription six months for each reader you  
send in. See if you can't do it before the  
December days.



Selfishness always defeats itself.

The Thanksgiving turkey is with us again.

A little success is better than a big failure.

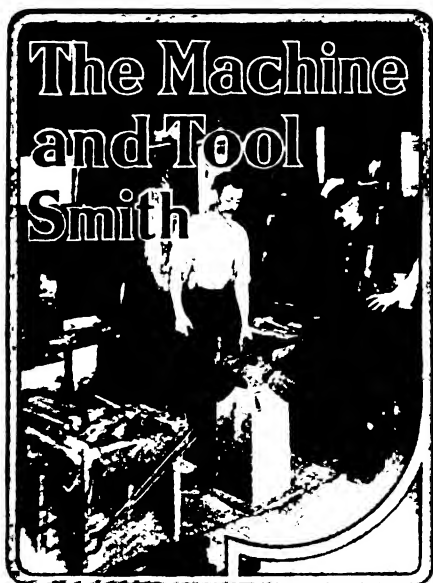
Doubt is the beginning, not the end of  
wisdom.

To-day is the accepted time for starting  
that association.



### American Association of Blacksmiths and Horseshoers.

The past few weeks have seen many initial meetings called throughout the country and we expect very soon to announce the organization of several branch associations. These branches will all be a part of the American Association and each one admitted adds to our strength. The forming of associations in the various counties and the organizing of them into one large national association is the only solution of the price-cutting and unfair-treatment problems. If smiths throughout the country would but realize the possibilities of a large national association they would not hesitate one minute to organize their respective counties. You know what the craft in your county needs and you also know that nothing but organization can effect a reform. Why not get the men together? All you need is to get started and with the individual help of each craftsman your association cannot but prosper and improve conditions. When we offer to show you how to form an association in your county, why not write us for our plans? It may be too late to start an association in your county if you don't commence soon. Remember, tomorrow is, was and always will be too late. Write today—now—immediately to P. O. Box 974, Buffalo, N. Y., and by return mail we will send you our complete plans for the formation of an association.



### Treating Burgess and Blue Chip Steels.

JOHN WYMOND.

A few lines in regard to the working and treatment of high speed steels. I trust this will be of benefit to my

brother smiths who are working steel. First I will take Burgess high speed steel No. 4. Make a good clean coke fire and forge the tool to a good bright heat (a good lemon color). Let it soak a few minutes before taking it out of the fire so that the heat will be through and uniform. After the tool is forged lay it in some dry place, say on the ashes of the forge, until cooled. Above all things do not harden the tool with the same heat it was forged with. After the tool is cold, heat it as short as possible and avoid as much heat back of the cutting edge as possible. If heated too long and placed in the cold blast it is liable to break in two when put in the lathe. Heat the tool slowly until it shows white heat, then turn off the blast for a few minutes to let it soak. Now open the blast quite wide this time until you see the steel begin to sweat or run. Then take the tool from the fire to the oil. I use raw linseed oil. Put the end of the tool in the oil and swing it back and forth until just warm. Then take the tool to the cold air blast and let this blow on it.

Speaking about steel I may as well mention the treatment of Blue Chip high speed steel. This steel is forged and hardened about the same way with the exception of using water instead of oil. Take the tool from the fire to a tub of water and move it up and down until black. Then take it to the blast. When cold, heat it again so it will show red in the dark, then lay it in the ashes until entirely cold.

### Forging and Dressing Lathe Tools.

DATTON O. SHAW.

Although high speed steel is taking the lead for lathe tools, crucible tool steel will probably be used more or less for sometime to come. To dress tools from this steel I forge carefully and harden at the refining heat in brine then place at once in a bath of boiling hot water. Let the tool remain in this bath for a few minutes or half an hour as the case may be. I have used the hot water bath for some time and it gives good satisfaction. In fact I use it more than any special bath in the shop. I have a steam pipe leading into a water tub and when the steam is turned on it heats the water quickly. I was taught to harden a lathe tool by heating it well back and holding the point in the bath until it hardened, then brightening with an emery stick. The point was drawn to a light straw or 430°. As

this tool was ground back it became softer and would not do near so much work as it should. Even 430° was too low to draw the temper and the tool was as hard at the throat or heel as at the point. I have not yet had any steel that would not stand the boiling water treatment. If a tool will stand up at 212° or boiling water you get the benefit of 218° in your tool which is practically all there is in the steel.

We sometimes get hold of a tool, that seems to be worthless. If it is left hard it will crumble and if the temper is drawn it will cave in. It has probably lost its carbon. I think it better to forge a tool on the other end, than to attempt to restore the end that has lost carbon. Some men claim that they can restore a tool by forging in a charcoal fire. This is done by packing a piece of steel in carbonizing material and sealing it up then keeping it red hot. It takes twenty-four hours to get the carbon to one-eighth inch in depth. How long will it take to forge carbon into a tool working in an open fire? Tools that are forged in a charcoal fire are superior to those forged in a soft coal fire as there is nothing in charcoal to injure the steel and if the tool is worked carefully the grain is made fine and tough.

### Hardening and Tempering Steel.—2.

E. B. MARKHAM.

Steel as the word was originally understood, is iron containing carbon in sufficient amount to cause it to harden when heated red hot and plunged in some cooling medium. Iron is extracted from iron ore in the blast furnace. From here it is drawn off and formed into pig iron. Pig iron when melted in the cupola and run into moulds is called cast iron, and is suitable for many purposes where great strength in small section is not required. Cast iron is brittle, fusible, and generally speaking cannot be welded, although cases are on record where blacksmiths have claimed by the use of certain fluxes to have united it. However it cannot be hammered when red hot as it contains so much sulphur that it is red-short—brittle. Cast iron melts at a temperature of 2100° to 2300° F. If pig iron is melted in what is called a puddling furnace, as shown in figure 1, which has a lining or fettling which

must be renewed after each heat carbon, silicon, manganese, phosphorus and sulphur unite with the oxygen from the hot blast and the iron ore lining, or fettling, thus reducing the molten metal to wrought iron. In order that the whole of the metal may come in contact with the fettling it is stirred constantly with rods called rabbles. It takes about 30 minutes to melt down. Then the carbon changes to carbonic oxide gas (CO) which makes a violent boiling for about 15 minutes. The manganese, silicon, etc., oxidize and form a slag. When all the carbon is boiled out bright points appear and the iron becomes pasty. When this appearance is observed the iron is gathered into balls and worked under the rolls and hammer to expel, as far as possible, the slag. The iron is now reheated and rolled between grooved rolls which unite the particles of iron. If the bar is rolled but once it is called, "muck bar". If it is cut up, piled, heated and rolled, or hammered, thus welding it, the product is called "merchant bar"; the best grades of bar iron are rolled the third time.

The type of furnace used when pud-

of steel. Wrought iron contains but little carbon, the percentage varying down to a trace. As the carbon decreases the malleability increases; that is, it works more and as the carbon grows less the melting point rises. The melting point of good wrought iron is about 3000° F.

For many years the only steel on the market was made by charging into bars of wrought iron a supply of carbon. The operation was called converting. The product was called cement or blister steel. The operation consisted of placing bars of iron in some receptacle with charcoal. The opening in the receptacle was sealed with fire clay. This operation of sealing or cementing kept the air from the steel. The receptacle was placed in a furnace and subjected to a yellow heat. The carbon given off by the charcoal penetrated the iron at the rate of one-eighth inch in twenty-four hours and as bars three-quarters of an inch square were commonly used it is apparent that the carbon working in from every side would penetrate to the center in 72 hours or three days. At the expiration of this time a bar that had been placed so one end pro-

it was called double shear steel. It is apparent that the slag in wrought iron remained when the iron was converted into steel and for many purposes this had anything but a beneficial effect.

A clock maker in England had trouble with springs made from converted steel, and as a consequence conceived the idea of getting a perfectly homogeneous steel which would be free from slag, by melting in a crucible pieces of shear steel. It was found that if the contents of the crucible was stirred while in a molten condition and then poured into a mold a lump of steel would be produced that was in every way superior to the shear steels. It was of a uniform condition throughout and free from slag. The name of the inventor of this process was Benjamin Huntsman and while there have been many improvements on his crude methods, yet the credit of the method is generally ascribed to him.

The crucible steel turned out by the leading steel makers today is a product that has never been equaled by any steel of the past for strength, uniformity and reliability. The custom at the present time is to charge into a graphite crucible pieces of iron or mild steel, together with a certain amount of charcoal with a little manganese and sometimes a little salt, or ferrocyanide of potassium. A cover is then placed on top and the crucible is set in the furnace. After three hours, during which the contents is melted, the cover is raised and the melter who is on top of the furnace examines the contents of the crucible, or charge as it is called, to determine the length of time necessary to devote to the "killing period". This period covers about  $\frac{1}{4}$  of an hour, and during it the metal ceases its motion and becomes quiet. It also takes silicon from the sand in the crucible. The silicon has a tendency to prevent blow holes. When in the proper condition, the molten steel is removed from the furnace, the slag on top is skimmed off and the steel turned into a mold, the resulting product is called an ingot.

Bessemer steel is the result of an experiment by Sir Henry Bessemer to make wrought iron by blowing several jets of cold air through a mass of molten pig iron. The vessel used is called a converter, a sectional view of which is shown in Fig. 2. The cold air passes through a wind pipe going through the trunion and down through the wind box as shown then up through the tuyeres, the air pressure being

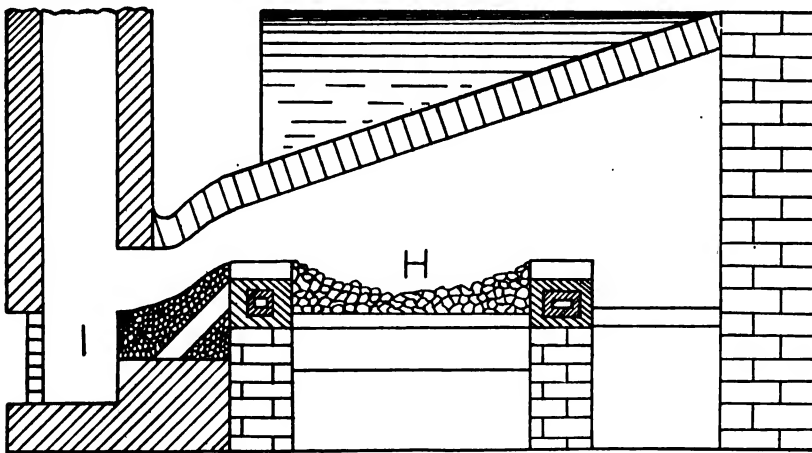


Fig. 1.—SECTIONAL VIEW OF REVERBERATORY FURNACE

dling, belongs to a class called reverberatory furnaces. They derive their name from the fact that the flame passing from the fire chamber I over the wall, passes over the charge of metal on the oval hearth H. The flame striking the roof is reverberated onto the work. The fuel does not come in contact with the molten metal therefore the latter does not absorb its impurities.

Wrought iron is extensively used by blacksmiths as it is readily welded, and practically free from liability to crystallize from shock. For use in machine construction and for similar purposes it is fast giving way to the low grades

truded from the box was drawn out, cooled and broken. If the carbon had penetrated to the center the fire was drawn and the charge allowed to cool off. After cooling the bars were put in piles of the proper size, placed in a reverberatory furnace having a flat hearth and heated to a welding heat. It was then placed under a heavy hammer and the various bars were welded into one. As the bars were taken from the charging furnace they were sometimes called blister steel. When they were piled and welded the product was called shear steel. If shear steel was piled, heated and welded into another bar

sufficiently strong to prevent the molten iron going down into the tuyeres. The contents of the converter was emptied into molds forming ingots which are later heated and rolled into bars of the desired size and form. For many purposes the product of the Bessemer converter gives excellent satisfaction and it is the cheapest method ever devised for producing any form of iron.

Open hearth steel. This process

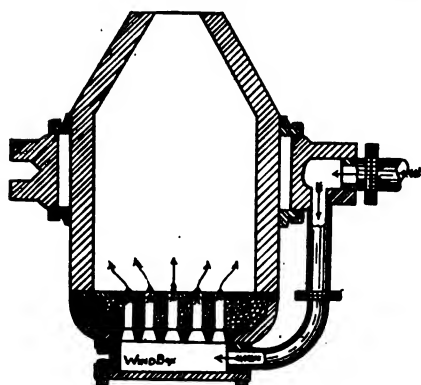


Fig. 2—SECTIONAL VIEW OF A BESSEMER CONVERTER

differs materially from that used in producing Bessemer steel in that heated air and burning gas is blown across the face of the metal in the furnace. The metal is fed in cold and melted by the gas and air. The product of the open hearth furnace is more under the control of the operator, and is more uniform and reliable than the Bessemer. Many excellent springs, hammers, and cutting tools of the coarser grades are made from open hearth steel.

The air-hardening and high speed steels will be treated later on.

The reader should understand that when making either the Bessemer or open hearth steels, that any desired percentage of carbon can be added so the steel will, if the carbon be high enough, harden as readily as tool steel. But not being as strong it is liable to crack when hardened if made in light sections and being weaker than tool steel it will not stand up if made into tools for cutting iron. Though an excellent quality of open hearth steel is at times turned out which works nicely for some forms of cutting tools.

(To be continued.)

### A Short General Talk.

DAYTON H. SHAW.

During my vacation this summer I had the pleasure of visiting several blacksmith shops. One that I saw was clean and neat, everything in order, the smith was pleasant and agreeable and as

far as I could see lacked nothing. To visit this sort of shop is a real treat and makes a man feel brotherly to the owner.

It seems that smiths have more or less trouble in tempering edge tools. I would advise that iron workers, who only occasionally handle steel, harden it in oil. There is less danger of cracking the steel if it is overheated or heated unevenly.

I firmly believe that no one can sincerely try to help another without helping himself. This putting on file what you know for fear someone else will get ahead of you, if not a mistaken idea, is certainly a selfish one. The student who would underbid his teacher and get his position would cheat his employers, and the right place for his picture would be in the rogues' gallery. I do not mean that if a man has spent time and money on some invention that he should give it away. He ought to get something for it and I would suggest that he apply for a patent at once.

A few years ago I was doing some work for a lumberman. He remarked that he was going back into the woods and wished he had some adjustable chain links to mend broken chains with. I made him half a dozen links after the pattern of some evener and whiffletree links that I had used. They were made of one half inch, half round iron in the form of a chain link, but in two parts, like a sister hook. The flat sides were placed together, one side covering the space on the opposite side. The pieces were held together with a blind rivet on one side, a little back of the center. In looking over some inventions a short time ago I saw this same link invented by a man in California. I wish him success and should he read this article I would like to hear from him as I once thought of applying for a patent on the same thing and am quite interested to know the result of his work.

### A Handy Tool for the Wagon Maker.

G. M. S.

I wish to contribute a plan for the making of a very handy tool for use when cutting down wagon wheels. We often find the spokes of wheels, stiff and without much give. The first requisite is an old bicycle chain. Having procured this, a lever marked A in the engraving is made. This lever consists of a round handle 7 inches long of  $\frac{1}{2}$ -inch stock. To this is fastened a plate  $\frac{1}{2}$ -inch thick by 2  $\frac{1}{2}$  inches long and  $\frac{3}{4}$  of an inch wide. Three holes are made in the flat piece as shown in the engraving. Then two hooks BB are

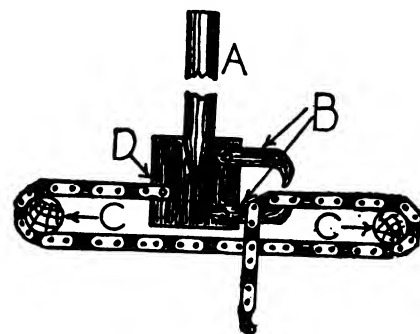
made 2  $\frac{1}{2}$  inches by  $\frac{1}{2}$  of an inch. These are fastened on one side of the flat plate at the holes which should be 1  $\frac{1}{2}$  inches apart. The chain is now fastened at the hole in the other side of the plate and the tool is complete. To use the tool, place the chain around the spoke ends and then bring between the two hooks. The tool is then worked similar to a wire stretcher.

### Repairing Broken Cog Wheels.

M. KNEPLINGER.

A broken tooth in a gear or cog wheel on the threshing machine, especially in the busy season, is of no little inconvenience to the farmer. Waiting for a new wheel is a loss of time and in view of this fact the farmer is usually willing to pay any price within reason for the prompt repair of the broken part. The smith will therefore do well to know how to replace the broken teeth and to make the wheel again serviceable.

My method of repairing a broken tooth in a gear wheel is to mortise a dove-tailed slot in the rim of the wheel at the point where the tooth is broken and then forge a soft steel tooth of the exact width and thickness as the broken one, but of a length equal to the height



A HANDY TOOL FOR THE WAGON MAKER.

of the other teeth, plus the depth of the mortise. This tooth is now forced into the dove-tailed slot and fastened with a wedge. If more than one or two adjoining teeth are broken this method of fastening will, of course, not be sufficient. In that case the teeth are made on one piece and the whole fastened by a rivet between every third and fourth tooth.

### Welding a Crank Shaft With Thermit.

EUGENE SHEER.

Some time ago the crank shaft on my large gas engine broke, and as a new crank shaft costs \$45.00 at the factory, and as it was impossible to weld the broken one in the forge, I decided to take advantage of the very interesting demonstrations I had witnessed at the St. Louis fair of "Thermit welding."

I bought an apparatus for \$40.00 and prepared the crank shaft for welding. The preliminary work was extensive, but the real operation was over in less than a minute. The thermit was ignited in a crucible, and in 40 seconds

forms of simple shape are used. A curved form, even if differing widely from the shape to be bent, provided of course it is small enough, aids very much in the smooth bending of curves. The form gives a better bearing to

a second line about two inches inside (on the concave side) as indicated by the dotted line. This should be backed up with a base, by nailing to an inch-board about the same length as the form, and ten or twelve inches wide. A casting made from this pattern will be heavy enough not to shift easily, costs very little, and after being used may be remelted and cast into other shapes. Several forms made in this general way can be so shaped as to cover almost any range of common bending. The working face of the form should always be the convex, or bulging side, as shown in Fig. 9, not the concave, or hollow side, as illustrated in Fig. 10.

If the concave side be used as shown in the last figure the tendency will be to give the stock too much of a bend. The action in bending is shown in the illustration; if part of the angle be bent to the curve the rest of the bar will be left sticking straight out, and as the bar is moved forward and brought back against the form it will lie, as shown by the full lines, in such a position that it is not possible to clamp the bar excepting at one spot. As the bar is bent in against the form it tends to assume the position shown by the dotted lines, and if prevented by the clamp from so doing will probably cause more or less of a kink.

284.

it was a mass of liquid steel at 4,500 degrees Fahrenheit. When the crucible was tapped the steel ran in moulds around the broken ends, melting them, and uniting all in one mass. The heat was so intense that it caused spectators to move back 10 feet from weld. Four hours afterwards the crank was so hot, it was impossible to lay the hand on any part of it, which had taken less than a minute to heat from time the match was applied.

There being 25 square inches welded, \$9.00 worth of thermit was consumed in this one operation; nevertheless it makes a great saving in repairing expensive machinery. It is being used for welding electric road rails, locomotive frames, breaks on vessels, making steel castings, and will soon have a large field of usefulness. Welding broken locomotive frames in position has been reduced in cost from \$300 to \$50 by this process. It was invented by a German chemist less than two years ago, and has been used in this country less than one year.

The thermit is composed of steel scales and aluminum, and when properly ignited a wonderful chemical action takes places.

#### Working Angle and Channel Iron—2.

JOHN L. BACON.

In the first article only such methods of working angles and channels were given as required no equipment other than that ordinarily found in a general shop. The present article will describe principally ways of bending where

work against as it conforms, at least partly, to the curve being bent.

About the simplest shape is a cast iron disc, or oval, about two inches thick and ten or twelve inches in diameter. A thicker, and therefore heavier form is better, giving a more solid backing to work against. For straight-

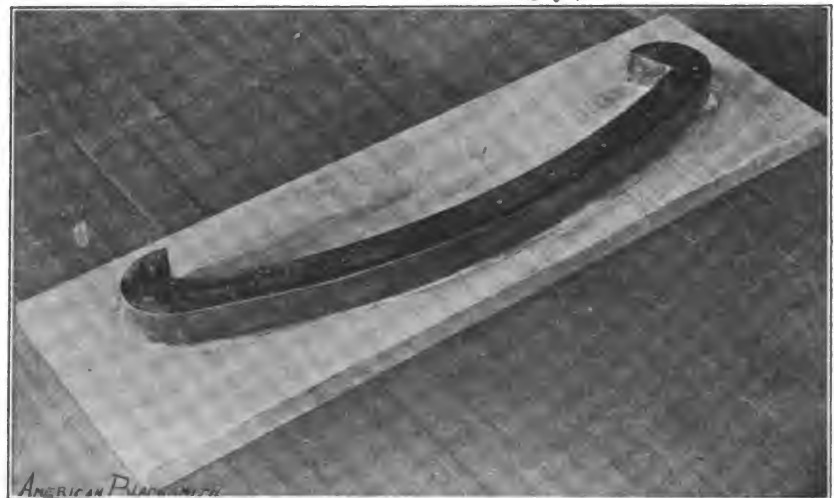


Fig. 11—PATTERN FOR FORM CASTING

ening kinks out of long curves and for general bending of a miscellaneous character a form of this shape is very convenient.

Where the work will warrant it a form following the shape of the desired curve as nearly as possible, is best. Patterns for this sort of forms can be easily made by sawing the desired shape from a two-inch plank, first laying out the curve as shown by the solid line in Fig. 9 and then drawing

When the convex side of the form is used the part of the bar already bent may be firmly clamped in position and the bending continued without the danger of disturbing the part already bent.

As an example of form bending, the long shapes shown last month in Fig. 5 will serve as a good sample. The form used for bending these is shown in Fig. 11, and was made in the general manner described above. The photo-



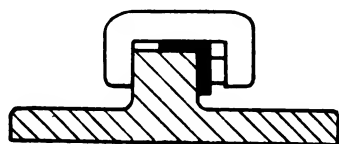
graph from which the illustration is made was taken of the pattern and not the casting itself as the casting had already been remelted.

It is convenient to have several simple clamps for holding the bars

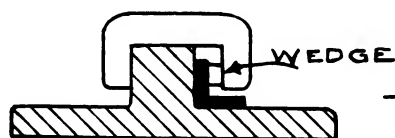
of the channel lies horizontal, the flanges extending downward. Two views of such a form is shown in Fig. 15, which also illustrates in the sectional view the method of applying the clamps over the edges. Channels

two branches of the trade may not come amiss just now. In the first place your wheels must be in proper condition before you put your tires on. A wheel is not in proper condition unless the spokes are tight in the hub and the rim. All new wheels are presumed to be tight, but frequently the rim stands off from the shoulder and won't stay down unless it is edged. A saw must be run through the joint to give a little opening, otherwise you will have what we call a rim-bound wheel. Upon the other hand you must not saw out too much or you may have an over-dished wheel. At the same time there must be a little dish to add strength as a brace. A straight wheel upon turning curves and sidling places is apt and frequently does break the spokes off a few inches from the hub. The draft as it is commonly called is the difference between the size of the wheel and the tire, and has much to do with the dish. An eighth of an inch draft is ample in light wheels.

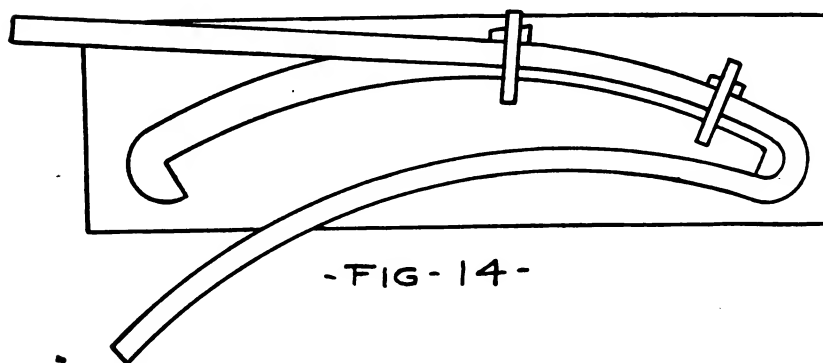
Much depends upon the quality of the wood in the spokes and some other conditions. The wood in the spokes may be as good and tough as grown and yet not fit for spokes. It must possess the characteristic stiffness as well as toughness. But notwithstanding the many essentials in making a perfect wheel from start to finish, one important point the writer had in mind when this article was begun is there is no excuse for burning a rim when putting tires on light wheels. Seventy-five percent of the smiths will heat a tire red hot in a few places and put it on. This is inexcusable and anyone who persists in such practice



-FIG-12-



-FIG-13-



-FIG-14-

Figs. 12, 13 and 14—SHOWING CLAMPS AND CORRECT METHOD OF USING.

while bending. A good shape for such a clamp and its manner of use is shown in Figs. 12, 13 and 14. When forming the bend shown, the part of the curve with the flange on the concave side was bent first. The bar was placed with the horizontal flange down and fastened with clamps as shown in Fig. 13. The angle was bent as far as possible at one heat, heated again, and the bending continued until the end was reached. The small end curves were bent around the semi-circular ends of the form. After the bend was completed on one side, the other side was bent in the same way, excepting that this time the angle was placed on the form with the horizontal flange uppermost as shown in Fig. 12, and the curve followed as illustrated in Fig. 14. The small bend in the end was the most difficult to make. The work was done by making the curve somewhat larger than required at first, and gradually working it down smaller, upsetting the horizontal flange and working it down with a flatter as the work progressed.

Forms for bending channel iron may be made in such a way that the web

are generally easily bent without any forms, as having flanges on both edges, the strains are equally divided and there is less tendency to buckle, while with angles, having a flange on one edge only, there is always a strong chance of buckling, even when handled with care. I beams and T iron may

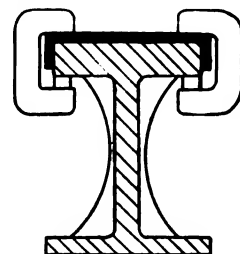
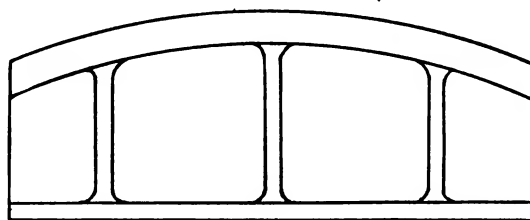


Fig. 15—SHOWING FORM FOR BENDING CHANNELS.

be bent in much the same way as channel iron, as both sides of the beam are alike in each case, and what buckle does form may be easily taken out over the anvil.

(To be continued.)

### Tire Setting and Banding Hubs.

J. M. FIX.

A few points which the writer thinks important in relation to these

should not be allowed to disgrace the craft. Heat the tire in the forge or any other way convenient, but not very hot. Wait a moment after taking it out of the fire. The heat in the hotter places will then lower and in the colder places rise. In a little while, if care has been exercised, your tire will be almost uniformly hot. Now put it on your wheel, which is screwed down and hammer up all

the kinks at once. It is not hot enough to burn the paint off. This is a common-sense method and an improvement over the heating in spots and then throwing water on it. It is unnecessary to use water and is not good on the paint. When the tire is cold, hammer it with the pene end of your hammer. This tends to take take up all the slack.

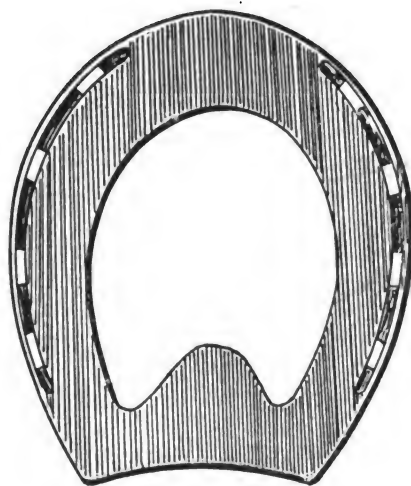
While the main principles are involved in all mechanics, handling differs somewhat from tire setting. It is no supposed that there are joints or cracks to draw up in a hub. But, as a tire, don't have the band hot enough to burn. Round the band up nicely, have a uniform heat and as hot as you can get it without burning. Use a set hammer or some special tool with which to drive it on not quite to the spokes.

### The Bar Shoe and Why it Should Be Used More Frequently.

DANIEL FERRON.

The frog of the horse was made of material to stand the wear and pressure in equal parts with the outer wall in order to save and protect the sole and weaker parts of the foot and to keep the heels spread so that they cannot contract. Now when we shoe the the horse with an open shoe at the heels and put on high calks, and raise him up so that the frog does not touch the ground, we are working against nature, as it has a tendency to push the sole of the foot down and make the foot become flat with bruised and sore heels. The back quarter of the wall is always the weakest part, and the greater part of the weight coming on the heel is why so many horses go lame with an open shoe. Whereas by putting on a bar shoe, properly made with a good big surface to cover the frog and by properly giving the right amount of pressure, which the smith should have the proper skill to know, this will not happen. If the horse has been shod with calks for sometime, so that the frog has not had any bearing on it, the frog becomes tender, so the first time you put on the bar shoe, be careful to not give the frog too much pressure. You can however increase the pressure gradually until the frog becomes used to the bearing and the entire weight is borne on the frog. Some smiths tell their customers the horse does not need a bar shoe, because they do not know how to make one. Another reason is that they do not know the value of the bar shoe to

the horse. I have cured very bad cases of corns, quarter cracks and sore heels with the bar shoe by setting the inside calk ahead, leaving room only for two or three nails on the inside to divide the bearing, so there will be at least one-half inch between corn and shoe. There will then be no pressure on the corn. This is principally for the young smith, but the older ones can also read it with profit, for in my traveling over the different States I have had an opportunity of seeing lots of poor shoeing by men who have worked for years at the trade. Buy THE AMERICAN BLACKSMITH, for in it you will find good articles from skilled and experienced men that will do you a world of good, make you a skilled workman, help you to keep up prices. This is the worst evil with which the blacksmith has to contend. Our craft should stand at the top of the list of trades of the world, and not at the bottom. It requires more skill to become a good horseshoer than it does to become proficient in any other trade, and as THE AMERICAN BLACKSMITH contains more information along this line than can be obtained in any other way, I would advise all



THE BAR SHOE SHOULD BE USED MORE FREQUENTLY.

young men to take it. In it you will also find plans how to organize each county in your state and every state in the Union, so that there will be a uniform price on all horseshoeing. All you have to do in order to have this is to take the paper, get your neighbor to take it, and then get together and appoint a committee to notify every smith in the county to come to a meeting at a fixed time and place, talk the matter over, get acquainted and become friendly towards each other. After holding several meetings, appoint a committee

to wait on your candidate who is running for assemblyman and tell him, "Mr. Candidate, you need our vote to help you obtain this office, and we will support you provided you will help to pass a law for the protection of blacksmiths and horseshoers, which we are sorely in need. We want you to do your utmost to get a law passed so every man will have to take an examination before a board of experts who will have to do their duty under penalty of the law." Now my dear brother smiths, you can get this law, if you work together. Until you do get it you can never have uniform prices nor prevent price cutting. When you do receive protection there is no better trade on the face of the earth. Wake up to your own interests, so that you can have two dollars for four new shoes, one dollar for setting four old ones, and one dollar for bar shoes. Read this over, give it to your neighbor to read, talk it over with them, ask them to help you to push the movement. Tell them that you don't want to put in a life of hard work, and then have nothing to show for it, when you are not able to work any more. When you have as good people as the American Association of Blacksmiths and Horseshoers at your back, don't let the opportunity pass by, but write them for their plans and say that you can be counted upon.

### Side-bones as a Cause of Interfering.

E. W. FERRIN.

The idea that side bones-ossified cartilages-has anything to do with a horse striking his ankles will be laughed at by the inexperienced, but it is true notwithstanding. A typical case which demonstrates the fact has recently come under my notice. The case in point being a horse, belonging to one of my old customers, one which I have shod for years. The animal never interfered before, but a few weeks ago it began to strike one front fetlock and as lameness had not yet appeared and neither any swelling to indicate the cause of the trouble, I thought that perhaps the feet were unlevel and proceeded to rectify the supposed defect, but all to no purpose. I tried various methods of shoeing without success. Finally lameness set in, but since the fetlocks were confused from the interfering, we concluded that the lameness was in the fetlock. As the lameness became more pronounced, we discovered that it was not in the leg that had the

bruised fetlock, but in the leg opposite and on close examination we discovered some swelling and soreness on the coronet. Unmistakably a side bone had developed on the outside coronet and the animal was promptly turned over to a veterinary surgeon for treatment. This is one of those cases where pain in the foot so interfered with

around the toe, leave the heel nails out and rasp down the wall over the side bone so as to relieve the affected part of the concussion.

Now as to curing the interfering in such cases when you have done all in your power to remove the cause, and the animal still interferes you will be compelled to protect the fetlock with a boot. A good springy rubber pad is the best method of removing the concussion to a side bone and if you can relieve the pain you will probably cure the interfering. Some years ago one of the horses of the Little Rock fire department developed a side-bone. This case set in with interfering prior to the appearance of lameness. After the lameness set in, the horse underwent a long course of treatment, but the ossification was so extensive as to unfit him for service, so he was relegated to the street cleaning department. But he has interfered ever since and wears out about four leather boots a year. Of course there are plenty of horses with side-bones, that do not interfere. It depends somewhat on the conformation of the animal's limbs and the extent of the ossification, but it is certain that pain in the feet is a common cause of interfering.



Fig. 1—SHOWING OSSIFICATION OF THE LATERAL CARTILAGES.

balanced locomotion as to cause the animal to interfere. In other words, in trying to save the injured part of the foot that hurts, the animal strikes the opposite ankle.

In this case the treatment is a question of veterinary practice. When the inflammation has subsided and the process of ossification complete, the lameness will probably be cured and whether the animal will be fit for trotting work will depend on the extent of the ossification. In slight cases (see Fig. 1,) the lameness will subside with the concurrent inflammation and the horse may be fit for trotting work again, there being no lameness, simply a loss of that elasticity which we observe in young and sound horses. But if the ossification extends to some articulation see Fig. 2 the result will be ancholosis—a union of the joint—with the loss of motion in the articulation affected and as a result, incurable lameness will occur, but many such horses may do walking work.

Nearly all horses with side bones travel better with the heels of the hoof high. Contraction of the heels always accompanies a case of long standing, therefore as a preventative all cases of side-bone should be shod with frog pressure. Use a bar shoe, nailed

### A Carriage Shop of Virginia.

H. L. KIBLER.

The accompanying engraving shows my shop, which is 18 by 36 feet and two stories high, the lower story being used for my blacksmith shop and the upper for painting. There is also a shed in the rear 16 by 18 feet which is not shown in the accompanying engraving. This I use for a wood shop and for material. During the summer



A CARRIAGE SHOP OF VIRGINIA.

season I work from one to three men beside myself, this season being much better than spring and winter. In winter I work only one man. I work where I am most needed, either at blacksmithing or woodwork. Prices are very low here as we have to compete with negroes and work of all kinds.

Below I give some of my prices.

New buggy tires, per set.....	\$4.00
Reset buggy tires, per set.....	1.50
Painting buggy, from.....	\$5.00 to 6.00
Horseshoeing for 4 new shoes ..	\$0.80 to 1.00
Resetting shoes, each.....	.10
Rimming buggy wheels, per set.....	3.00
Spokes, each.....	.10
Reset wagon tire, each.....	.50
Wagon spokes, each.....	.20
Rimming wagon wheels, each.....	1.40

While our prices here are very low, living is also cheap. I think a man can do better running a small business in a country town than in the city where prices for work are much better. I have tried both and find the country much better both for health and saving money

### A Talk on Sensible Horse-shoeing.

PARVENU.

I have been at the trade most of the time for thirty-five years and have made some study of cause and effect and I claim that any one who will study



Fig. 2—SHOWING SIDE BONE RESULTING IN OSSIFICATION OR ANCHYLOSIS OF THE JOINT.

nature and nature's laws can do almost anything with a horse's foot if it is properly handled. There is a vast difference in the make-up of horses as well as other animals. The closer any one follows nature the better success he will have in curing any disorder or ailment. Of course in case of deformity, we have to use our best judgment to overcome the defect and it may take hard study to master the situation, but there also are you the more liable of success if you turn back to nature. Any blacksmith or horseshoer that cannot depend on his eye for part of his work, will have a hard row to hoe, for it will take him much longer to accomplish certain jobs than his quicker-eyed fellow-workman. As to horseshoeing, I have found that there are no set rules, or at least that is my experience. For not only does each horse present different features, but each foot is different. It is to my

opinion that one can make a life study of the horse and his feet and then not be able to remedy all cases. My method is to get the horse's feet straight and level and to make the shoe bear on the shell. Naturally, the shell is to be shed, but if the shoe rests inside of the shell it pre-

and then again the ideas from some self-made mechanic are very laughable. I have read so much about shops in the East that I would like to tell you about my shop which is situated in the most beautiful valley in California, the Santa Clara Valley. I am three miles from

but I have very little slack time here. I always run one fire the year round. I have a 34-horsepower gasoline engine that I use for pumping water. Through the summer all the country roads are sprinkled and I make quite a little pumping water. The accompanying engravings show my ideal home as well as the best equipped shop in Santa Clara County.

### The Opinion of an English Brother.

W. D. W.

I have read with interest the editorial in the July issue on "Does The Paint Shop Pay?" There are a great many in this country that do not pay. I think this is because the masters do not go carefully into the actual cost of the job. This is especially the case where the master himself is not a painter. I believe that if the painter were to carefully book all materials used on a job, a fair proportion for wear of tools, the dead shop expenses such as rent, rates, insurance, lighting, heating, etc., together with the actual time taken by the painter, that the cost in many cases would surprise them. All employees should of course have time sheets. In the paint shop where I was apprenticed, the foreman had to carefully note the exact quantity of all materials used on one carriage of each particular type we made. Each carriage of that type was then charged with that amount, a fair proportion of the dead expense and



EXTERIOR VIEW OF THE CALIFORNIA SHOP.

vents shedding and also prevents expansion. The foot should be concave on the bottom and if too wide, should be narrowed, and if too long, shortened. Take a man, for instance, if his shoe is too wide it is not comfortable, if too long he will stumble.

Of course any defects in the foot must be brought out by degrees. They cannot be hurried too fast. And here is a point on horse owners—they will not tend to the case as requested and then they blame the smith for not shoeing his horse right. The smith is placed in the same position as a physician; if the patient will not follow directions how can he do any good? Right here let me ask, why should not the smith be compelled by law, the same as a physician, to be in possession of a certificate as to his knowledge of a horse, the same as a doctor is of his knowledge of the human body? I think it more inhuman to abuse an animal that cannot defend itself than a human being who can, and because we are not compelled to have certificates is the reason those who have learned the trade do not get full value for their knowledge, for many men have not served as apprentices. One smith who came from the farm and started a shop, told me, if he could make \$1.50 a day it would be better than on the farm, but he admitted the scrap pile showed his deficiency of knowledge.

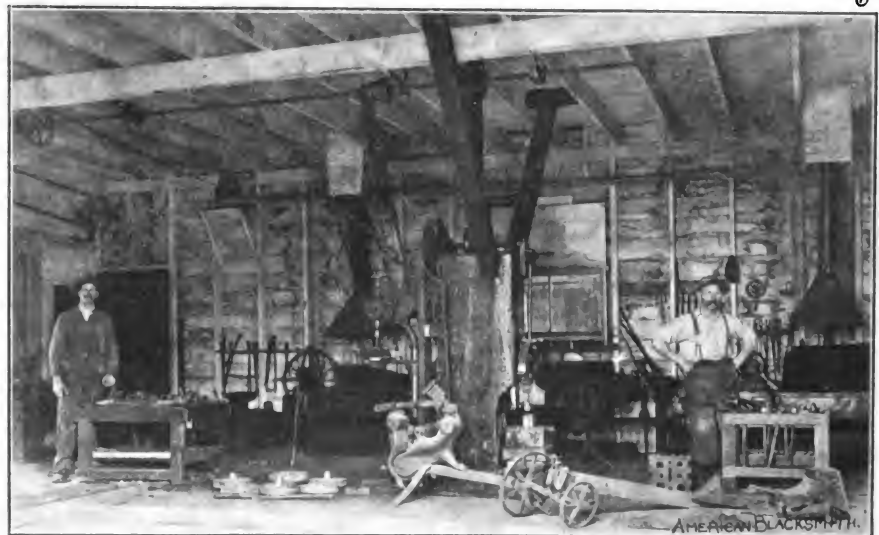
### A Shop in the Land of Roses.

C. G. SIGURD.

I am very much interested in your paper. I find some very good ideas in it

town and at the corner of two principle country roads. I have a shop and general merchandise store, five acres of fine orchard and a six-room cottage, with plenty of roses the year round.

My shop is 30 by 40 feet and I have a six-horsepower gasoline engine that saves me a great deal of hard labor. I run a large power hammer, emery wheel, saw, drill, tenon boring machine and two fires. My shop faces one road



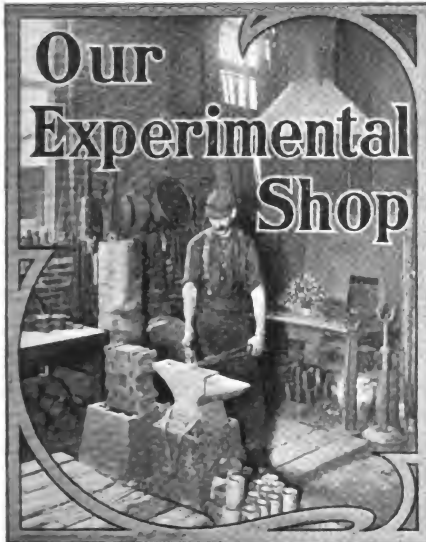
INTERIOR VIEW OF THE CALIFORNIA SHOP.

and the store another. Over the shop I have a room 30 by 40 feet in which I store fruit trucks, cultivators and weed-cutters as I get them made. I have to keep them on hand as there is a great call for such implements. I make such things when business gets a little slack,

the man's time on the job. This was all booked by a prime cost clerk and the exact cost of each vehicle known. I have a small shop in mind now, whose owner, when asked to give in an estimate for re-painting, will look at the job and reason thus: The painter will do this in a



week; the stuff will cost about so much. He then adds what he considers a fair profit and puts that price in. He never allows anything for shop room, for dismounting, setting wings, steps, joints that have to be cleaned off, mouldings that need a few pins in, old buttons, stitches to the cushions, remounting, oiling up, etc.

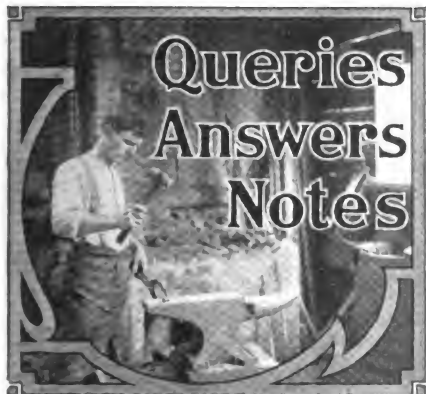


Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

The foreman finds most profitably invests the time he spends in studying the abilities and failings of the men under him.

A smith who knows his business when it comes to welding springs and axles, "As to a flux in welding tool or soft steel at the anvil, as good as any is borax and steel chips. After making the scarf place a little borax on it and when melted sprinkle a few steel chips on the surface of the scarf. Now a little more borax. Then hold the pieces in the fire, scarf side up, until hot enough for the chips to stick. Then carefully turn the pieces over and bring the heat up, using a hollowed fire. When ready to weld, take out but do not rap on the anvil."

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The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

The American Blacksmith Gets Credit. I have been running a shop 22 years, now have the best shop I ever had and

must give THE AMERICAN BLACKSMITH credit for it. Am running my shop with 3 horse electric motor. Have power hammer, drill, emery wheel, grind stone, disc sharpener, cold tire setter. I got most of my tools from advertisers in the AMERICAN BLACKSMITH. H. B. NIXON.

Melting Brass.—Will some brother please tell me what I could put in brass when melting it, so it would become thin? I can melt it, but it is too thick to run in small boxes. JOHN TIEKING.

Packing Rings.—What kind of packing rings are used on steam-hammer piston heads? I have tried cast iron, mild steel and also brass rings but they only last a short time. CARL A. GILLEN.

Forging A Grub Hoe.—I would like to have some brother smith tell me the best way of forging a double bitted grub hoe. Will some one aid me? W. H. MOSS, JR.

The Size Of Wood Screws.—I would like to ask through your paper how wood screws take their size. Is it by the amount of threads that they length and size? Will some brother please answer? I think it will be of great interest to all that do not know. B. C.

Heat In Horses Feet.—Can some brother tell me how to take heat out of horses' feet? I have tried lots of things that will take it out for a day or so but would like to know of something that will take it out and also keep it out. Do any of the brothers do any brazing with Brazit? If so, let us hear from you. O. W. TAYLOR.

Blower vs. Bellows.—Mr. Duplisea asks which is best for general work, blower or bellows. We took out a bellows and put in a blower last winter, and are well satisfied with the change. In fact would not take a bellows as a present and use it if we could buy a blower. J. M. RAY & SON.

Several Questions On Casting.—Will some one who has had experience in making small castings tell me through THE AMERICAN BLACKSMITH if molds can be made so they can be used several times? If so how and of what are they made? Using sand and laying up every time is too expensive. Also, how should crucibles be used for melting iron? Can some one tell me how to build a small furnace for melting, from 3 to 4 gallons of iron? JOHN W. RUSSELL.

A Question On Co-operation.—I have run a blacksmith shop for many years and now want to furnish shop and material and let it out on shares. I would like to know if there is any rule to go by in dividing profits, say I furnish the material which amounts to more than the work. How would it be divided? For instance, I furnish a tongue which costs \$1.75 and the workman would put it in and charge \$3.25, what per cent is he entitled to? Perhaps some of your old smiths may be able to give some general rule. J. A. SIMMS.

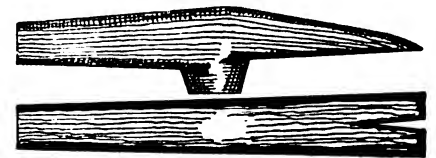
Making Chilled Rolls.—I would like to know what kind of steel to use and how to harden tools to cut chilled rolls for rolling iron. I am blacksmith in a mill and find it a difficult job to make the tools do their work properly. W. M. CHAMPION.

A Mule With A Club Foot.—I have a mule colt three years old. In the last five months he has gotten club footed. Before that time his feet were straight and all right, but now his right front foot is drawn so he walks right on the toe. He does not limp on it and it is not swollen. He has been shut up in a small lot all the year, but has not been grazed or had room to run and frolic much. Can some brother tell me the cause and what to do for him? We

enjoy reading THE AMERICAN BLACKSMITH very much. W. H. HOLLIDAY.

Hardening Track Tools.—In reply to Mr. Patrick Maher I would say, when forging track-tool steel, great care should be taken in heating. Do not rush it too fast and be sure it is heated thoroughly. A good way to test the depth of the heat at any time is to stop your blast just for an instant. If the color holds up to what it was before the blast was stopped, the heat is through the piece, but if the piece is not thoroughly heated, the material will show it almost as soon as the blast is stopped by turning black. Do not work this steel dark red but keep a good bright heat on it throughout the forging. When the tools are forged, reheat them and allow them to cool gradually then when cold reheat to dull red or just so the steel will not scale and temper the tools in clean water heated to about 90°. Try this plan with your new and old tools. It will repay you for your trouble and you will be surprised at what a low heat steel can be hardened. C. H. RICHARDSON.

How To Make A Tack Hammer.—In answer to Mr. J. M. Johnson's query I give diagram of a tack hammer. In making this hammer the eye is punched first of all. The stock can be most any size according to weight desired. The length of hammer head from face to claw is 5½ inches. The diagram shows where hammer is fullered



HOW TO MAKE A TACK HAMMER.

and its general shape. The V shaped slot for pulling tacks is made slightly beveled on its edges so as to go under the head of the tack easily. This hammer, if made properly is strong and light, and fitted with a good stout handle will outlast the factory hammer. R. S. HENRY.

Shoeing the Horse with the Twisted Foot.—This is the first time I have ever undertaken to write anything for THE AMERICAN BLACKSMITH, but I see so many good things in the paper that I would like to add something to the columns. I trust it will be a help to some brother smith.

First I shall tell W. C. Robinson how I should shoe the horse with a front foot twisted in and throwing all the weight on the outside quarter. I would use a barshoe made so that it will set flush at the outside toe, taking a little off from the inside toe at each shoeing. The shoe should have a low toe and medium high heel with a good frog pressure and the outside calk should be welded on from the first nail hole at the heel and left to extend over the back of the shoe about an inch, giving it an outward curve of about 45 to 50 degrees. The horse should be shod at least every three weeks, and the inside heel kept well trimmed down. In shoeing stumbling horses with a high heel and low toe, the toe calk should be rounded over at the edge a little, like a rolling motion toe.

Now I will tell my readers something about my shop. My brother and I run a shop together. He does the floor work and I work at the fire. Prices are quite low here on repair work. For shoeing we get as follows: bar shoes 50 cents a piece, new shoes 25 cents each, setting shoes 12½ cents each. We do considerable forging in our shop and that is one reason why I like THE AMERICAN BLACKSMITH. I get many new ideas and a great deal of good from the paper. W. H. MOSS, JR.

**An Oklahoma Price List.**—The following is a partial list of the prices we get in this territory:

Plow shares, 12 inch.....	\$ 3.00
"    "    14 ".....	3.25
"    "    16 ".....	3.50
Sharpening.....	.25
Fin cutters.....	.75
Bar shares.....	\$2.50 to 3.50
Bars.....	1.50 to 2.00
New lister lays.....	3.00
Subsoilers.....	\$1.00 to 1.50
Points.....	.50

#### CULTIVATORS.

New cultivator shovel set.....	3.00
Point set.....	2.00
Sharp set.....	.50
Beam setting.....	\$0.15 to .25
Discs, each.....	.25

#### VEHICLE WORK.

Wagon tires, set.....	2.00
Buggy tires, set.....	2.50
Wagon axles.....	3.50
Buggy hubs.....	\$6.50 to 7.00
Buggy beds.....	10.00
Wagon tongues, pole only.....	2.50
Buggy tongues, pole only.....	2.50
Circles.....	.75
Doubletrees.....	\$0.75 to 1.00
Tongue and shaft irons welded.....	.50

#### HORSESHOEING.

No. 3 shoes and under, plain.....	1.25
No. 3 shoes and under, toed.....	1.50
No. 4 shoes and over, plain.....	1.50
No. 4 shoes and over, toed.....	2.00
Resetting.....	.20
Paring feet, one horse.....	.15
Paring feet, team.....	.25

GORDON BURGHART.

**Dividers vs. the Tire Wheel.**—Queer that all these good people writing about tire-setting should be wrong. This is simply because they do not go far enough in their arguments. One says to use the divider because it is quicker; another says it takes about as much time to center punch the tire and set the dividers as it would to use the traveler. Then others fall out over the amount of heat and the number of heats.

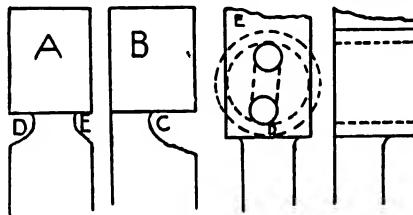
My views on this subject are as follows: When there is no change to be made in the size of the rim in repairing it for the tire, and where the smith himself knocks off the tire, he can safely use the dividers, without at any time using the traveler. The traveler may be used to find the difference in the size of the wheel and the tire, but having ascertained that the shrinkage may be measured by the dividers. In using the latter, it is never necessary to counterpunch for points of measurement, as the bolt holes will serve very well for this purpose. I refer to buggy and carriage work. A good many so-called smiths don't know how to take off the tire, let alone solving the problem of putting it on. Before removing a tire, in fact, before taking up a wrench to take off a single tire-bolt nut, it should be marked with a center-punch at a joint hole. When upsetting the tire it should be upset in the space next to the opposite joint holes. If it needs to be upset about  $\frac{3}{16}$  of an inch, give it all on one side of the joint. If more than that amount, shrink a little at each side of the joint opposite the punch mark. Always work close to the joint opposite the mark. In putting on the tire, insert a pin at the marked hole and then there will not be any unnecessary boring of the rim to make the holes hit.

Any good smith can tell how much expansion is induced by a single heat, but where the tire has to be shrunk in two places, i. e., at each side of the joint opposite the punch mark, it would be more sensible to use the traveler. When a new piece of rim is to be put in, be careful to mark both your tire and the rim at the sound part.

RICHARD O'HEARN.

**Forging a Gaff Hook.**—In Mr. Wm. H. Respass' query in the August edition as to the best method for forging a Gaff hook, he mentions the eye or band on the hook as the most troublesome part of the work. While I do not understand why this part should give any more trouble than the rest of the work, I submit the following article and sketch hoping they will be of some use to him.

Fig. 1 shows the different steps taken when forging from the solid. Two views of the hook blocked off on a piece of stock



FIGS. 1 AND 2—FORGING A GAFF HOOK.

forged to the required size is shown at A B, with the added allowance for wasting and allowing enough for the hook. The piece is fullered on three sides C D E and the shank for the hook is drawn so your handy tongs will hold it. Now punch the hole as shown at D, Fig. 2. If a punch the full size of the flat hole were driven through the piece, it would reduce the depth of the ring so it could not be finished to the size desired, so it will be best to punch two small

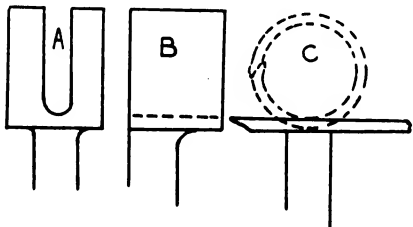


Fig. 3—FORGING A GAFF HOOK.

holes say  $\frac{3}{8}$  inch in diameter, and about the size of the band  $1\frac{1}{2}$  inches apart. Now cut out the bridge, between the holes, and drift out the band as shown by the dotted lines at D. Repeat and place the pin in the hole and fuller in the sides as shown at E, Fig. 2. This end is left on to prevent error. If the hole is punched as described the band will never become too large. By leaving the end on when fullering down the outside the pin is kept tight and if hit a blow now and again the hole will increase in size, so by the time the end piece is fullered off, the inside of the band will be about finished too. The eye being finished next dress the hook.

Now to weld the eye on the hook block out the piece as shown at A and B Fig. 3 and then draw the ends as at C making them slightly heavier than desired when finished. Now lay off the circumference of the band and bend it as shown by dotted lines, arranging the lap so it will come on the side. Then with a good clean heat, weld and finish off. C. H. RICHARDSON.

**Regarding Tire Setting.**—In regard to that tire setting question, will say that I know of no better way to set tires than the old way of taking them off, shrinking them as required by heating and then putting them on. I always burn the ends of the spokes off about  $\frac{1}{4}$  of an inch inside the face of the rim, so as not to dish wheel too much or bend the spokes. By clamping the wheel solidly to a frame I can put a tire on tight and still leave the wheel in good shape.

I expect the cold tire shrinker men will kick on what I have to say about cold tire work, but I think what I say will benefit

some of the craft. There are few men that will do good wheel work with the cold tire machine. Will the operator of a cold tire setter remove the tire, wedge the loose spokes, bore off the ends and then put the wheel into shape? No, of course not; why should he when he can put the wheel in the machine and shrink it in a few minutes and make it look just as good to the inexperienced farmer as though he had done the job as he should. Some smiths may do it right, but will the majority? Then again, will the smith turn the wheel and shrink the tire in several places as it should be, when he can make it tight and look good to Mr. Jones by shrinking it only in one place? Now, my motto is: "Honest work that will give my customers satisfaction." I can say (not bragging) that I have few, if any customers that are not satisfied with my work. I know this because my trade is increasing every day and I still have my first customers notwithstanding the fact that my prices are much higher than my predecessor. Of course, the people kicked a little at first, but they see it is better to pay a little more and get good work than to pay less for cheap work.

What I would like to see is more co-operation among smiths. If the smiths of a county would get together once a year when work is slack and have expert mechanics give addresses on the different work that comes to the shop, it would be of untold benefit and the cost very slight to each smith.

J. W. SMITH.

**A Letter From Dixie Land.**—I always look for my paper 3 or 4 days before it is due. I have not worked at the trade for the past three years but am just as anxious to look the paper over as ever and I expect to take up the trade again. I stood over the forge for 12 years and I learned my trade from experience and good papers and books. Any man who does not read good books and papers on his trade is not up-to-date. If the wagonmaker would put better work and material in their jobs they would be better off today. One great trouble with the job shop blacksmith is he slights his work and if he ever commences to slight his jobs he will continue. Keep your job clean from start to finish and you will like it better. Never bolt a piece that needs rivets and never rivet a piece that ought to have a bolt. Never brad or batter your bolt ends, just cut them off clean.

Never use prepared or cheap glue, use the best white glue. Put it in a vessel at night and cover with clean water. Next morning pour off the water and heat the glue. Do not get it too hot or it will burn. Set the vessel that holds the glue in a vessel holding plenty of water. Do not heat to a boiling heat but let it stand for two hours. It will then be ready for use. If it is too thick thin with a little hot water.

Painting pays by painting cheap jobs with ready mixed paints. But for a blacksmith to do regular carriage painting and trimming, it does not pay. In the first place a well painted buggy does not look right with a ragged top, back or cushion and these call for a trimmer and upholsterer. Second, it costs considerable to take off the old paint. If you do not, you can not make a first class job. Third you always have to make more or less repairs which you did not figure on. When you refill Sarven patent wheels take out the rivets. If it were best to leave them in, the factory would put them in first when they build the wheel. You must look at all of this and judge for your self and not what other smith's ideas are.

Keep your shop clean. Buy the best make of tools and have no other. Have a place for every tool and see every night when you quit work that every tool is in its place.

DIXIE LAND.

# SUPERIOR Horse Rasps

## The Best Yet

Best High-grade Steel.  
Hard, Thorough Temper. Sharp Cutting Edge.  
Sharp, Strong Teeth, Well Backed.

## Every Rasp Perfect and Warranted

Made in all regular sizes, and in the new 18 inch Slim,  
which gives the user the advantage of a long stroke,  
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Analysis by  
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Volatile Matter,	24.12 per cent
Sulphur,	0.56 per cent
Carbon,	69.51 per cent
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SEYMOUR, CONN.  
SOLE MANUFACTURERS



**Prices Current—Blacksmith Supplies.**

The following quotations are from dealers' stock, Buffalo, N. Y., Nov. 1, 1906, and are subject to change. No variations have taken place since last month's quotations.

All prices, except on the bolts, are per hundred pounds. On bars and flats prices are in bundle lots.

**Bars—Common Iron and Soft Steel.**

$\frac{1}{2}$ in. round or square; Iron, \$2.80; Steel, \$2.90
$\frac{3}{4}$ in. " " " 2.40 " 2.50
$\frac{1}{2}$ in. " " " 2.20 " 2.30

**Flats—Bar and Band.**

$\frac{1}{2}$ x 1 in. Iron, \$2.30; Steel, \$2.80
$\frac{3}{4}$ x $\frac{1}{2}$ in. " 2.20; " 2.20
$\frac{1}{2}$ x $\frac{1}{2}$ in. " 2.40; " 2.40

**Norway and Swedish Iron.**

$\frac{1}{2}$ in. round or square, \$4.80
$\frac{3}{4}$ in. " " 4.50
$\frac{1}{2}$ in. " " 4.30
$\frac{1}{2}$ x 1 in. " 4.80
$\frac{1}{2}$ x $\frac{1}{2}$ in. " 4.20

**Horseshoe Iron.**

For No. 1 shoe, $\frac{3}{4}$ x $\frac{1}{2}$ in. \$2.50
For No. 2 shoe, $\frac{1}{2}$ x $\frac{3}{4}$ in. 2.50
For No. 3 shoe, $\frac{1}{2}$ x $\frac{1}{2}$ in. 2.50
For No. 4 shoe, $\frac{1}{2}$ x $\frac{1}{2}$ in. 2.50

**Toe Calk Steel.**

$\frac{1}{2}$ x $\frac{3}{4}$ in. and larger, \$3.00
--

**Spring Steel.**

$\frac{3}{4}$ to $1\frac{1}{2}$ in. Rounds, Op. Hearth \$3.00, Crucible \$5.00
$\frac{1}{2}$ to 6 in. by No. 4 gauge to $\frac{1}{2}$ in. Flats " 3.00, " 5.00

**Carriage Bolts. (Net Price per Hundred).**

$\frac{1}{2}$ x 2 in. \$0.54	$\frac{3}{4}$ x $\frac{1}{2}$ in. \$0.82
$\frac{1}{2}$ x $\frac{3}{4}$ in. .58	$\frac{3}{4}$ x $\frac{3}{4}$ in. .96
$\frac{1}{2}$ x 8 in. .62	$\frac{3}{4}$ x 6 in. 1.31
$\frac{1}{2}$ x 2 in. .65	$\frac{3}{4}$ x 4 in. 1.70
$\frac{1}{2}$ x 8 in. .75	$\frac{3}{4}$ x 6 in. 2.10

**WANTED AND FOR SALE.**

Want and for sale advertisements, situations and help wanted, twenty-five cents a line. Send cash with order. No charge less than fifty cents.

**WANTED**—Horsehoer. Woodworker and good general Blacksmith. Address,  
**SCHMITT BROS., Nichols, Iowa.**

**FOR SALE**—A first-class blacksmith shop and house with tools and machinery. Address  
**L. G. HEIDNER, Parkston, S. Dak.**

**FOR SALE**—My shop and tools. Asap. For particulars write  
**W. H. EXLEY, Palmyra, Nebr.**

**WANTED**—Blacksmith competent to forge heavy surgical instruments.

**HAUSSMAN & DUNN CO., 107 S. Clark St., Chicago, Ill.**

**BLACKSMITH WANTED**—Good chance for an all around country blacksmith. Good shop, rent cheap. Address  
**MARY P. HORNING, Grantville, Kans.**

**FOR SALE**—Blacksmith business and good set of tools. Good trade, no opposition. Address,  
**IRVIN CUSTER, Vinco, Pa.**

**PATENTS**  
Herbert Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C., established 1884. I make an examination free of charge and report if a patent can be had; also the exact cost. Send for circular.

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While the supply lasts we offer you an opportunity of getting 50 calendars at cost, each printed with your own name and address. The price includes all postage and packing charges.

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2. 50 Calendars, and one year's sub. 2.75
3. 50 Calendars and two year's sub. 3.25
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We recommend that you take advantage of the liberal four-year offer. The paper alone or the calendars, either, are worth more than \$1.00.

If you are not a subscriber, you can take advantage of offers (2), (3), or (4) above. If you can't use 50 calendars, \$1.00 brings you the paper from October, 1905, to January, 1907. Write for particulars, but write at once.

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Blacksmith and Wagon Makers' Supplies,  
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**Wholesale IRON, STEEL and HEAVY HARDWARE.**

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Send us a Sample Order.

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**Steel and Cast Skeels. Iron and Steel.**  
**WRITE FOR LOWEST PRICES.**

**Trade, Literature and Notes.**

AN INTERESTING CIRCULAR has been received illustrating the well known runners and sleigh knees manufactured by The Sherwood Hall Co., of Grand Rapids, Mich. Some of these are shown in their advertisement on page 24. The Sherwood Hall Co. carry a complete line of these goods and advise us that they are prepared to fill orders promptly. Send for prices and interesting circulars.

FOR TWENTY FIVE YEARS, Big Vein Piedmont Smithing Coal has been used with satisfaction by the blacksmith. The Davis Coal & Coke Co. of Chicago, Ill., enjoys a tremendous sale of this product and invite all who are interested in having good coal to write to them for prices and circulars.

A HANDY SHOP DEVICE is the Reynolds Axle Gauge, manufactured by The E. T. Buhl Mfg. Co. of Cleveland, Ohio. For simplicity of adjustment and accuracy of gauge they claim it has no equal and are willing to send it to any address on 30 days trial free. Descriptive circulars may be had by addressing this firm at the above address.

MANY OF OUR READERS are making snags by mending broken castings with "Brazil," a brazing compound manufactured by the U. S. Brazing Compound Co. of New Bedford, Mass. There seems to be good profits in this work for the smith and if you have not tried "Brazil" it may pay you to send for a sample working set, which this firm offers to send to any address postpaid upon receipt of one dollar. See advertisement on page 3 of this number.

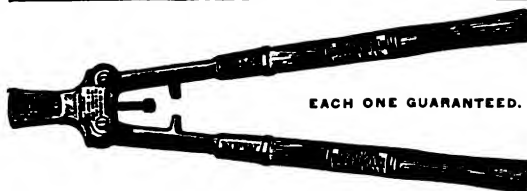
PATENT HAS BEEN GRANTED on the Mayers' Cold Tire Setter, we are advised, by the Henry Mayers Machinery Co., St. Louis, Mo. Since the introduction of this tire setter to our readers, it has become very popular and the manufacturer has received scores of testimonial letters. See cut of this machine on page 10.

THE SCHUBERT BROS. GEAR CO., ONEIDA, N. Y., have just issued a new 60 page catalogue replete with illustrations showing their excellent line of high grade vehicles in the white. The catalogue also contains complete descriptions and gives interesting prices on these goods. Send for a copy of this book today. Mailed free to your address upon request.

A NEATLY ILLUSTRATED CATALOGUE from The National Safety Fifth Wheel Co., Lancaster, Pa., shows that the construction of their patent fifth wheel and the fifth wheel described in our paper last month by Mr. J. Lawrence Hill in his "Plans for Making a Milk Wagon" are of practically the same construction. This construction has many advantages which will be gladly explained by the above named firm. AMERICAN BLACKSMITH readers are requested to write for particulars. DEPARTURE FROM THE BEATEN PATH of gas engine construction singles out the Robertson Automatic Straight Line Engine as different and distinct. This engine is constructed with a crosshead and slide, thus allowing the piston to travel in a straight line and bringing wear on the cylinder down to a minimum. These engines are built on the four



cycle plan, and are equipped with a most simple sparking device of the wipe type. They are simple in construction, handsome in design and altogether, are most efficient power generators. Robertson Automatic Straight Line Engines are built in units from 4 to 12½ H. P. single cylinder and from 16 to 25 H. P. with double cylinders. Full information regarding these power producers may be had by addressing the builders, The Robertson Manufacturing Company at Buffalo, N. Y. Their announcement in this issue appears on page 18.



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**N. Fifty-Second Street,**

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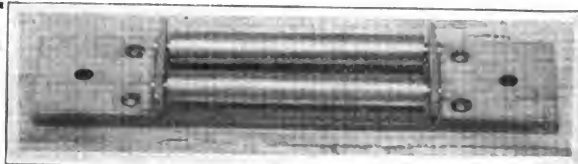
Only keen cutting edges on dies of the correct form will produce good threads, and the full worth of dies can not be secured unless these edges can easily be maintained in a sharp condition; therein lies one of the points of superiority of our make of die stocks. Catalog on application.

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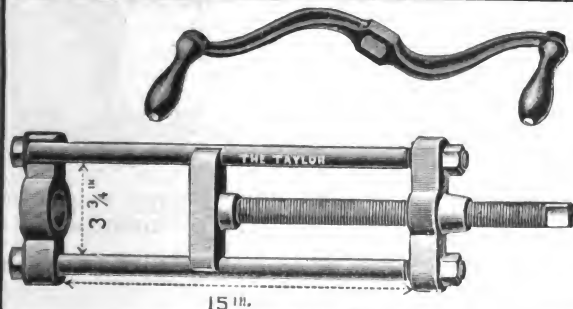
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We make the following sizes:  
No. 1, 3 in. wide, 14 in. high  
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### The Bruce Malleable Wagon Standard



This shows the strength of our **STANDARD** compared to the old style.

This Malleable Iron Bolster Standard has been tested thoroughly, and we guarantee it strictly as represented.

Anyone familiar with the farm wagon will readily see the great advantages of the Malleable Iron Bolster Standard over the old style.

1. Made of the best grade malleable iron. It has been thoroughly tested by factories and wagon makers and pronounced a great success.

2. It is attached to bolster by means of two bolts passing through bolster from the side, and one bolt from top to bottom of bolster, thus holding standard perfectly solid, and at the same time strengthening end of bolster, which in old style is weakened by mortise.

3. The Malleable Iron Standard has a 1 1/2 in. face at base, which prevents wear on wagon box, while the old style has only a 7/8 inch face.

4. Great time saver. Can be attached to bolster in one-fourth the time required to put on wood stake. Adapted to new and repair work. The price will justify all classes of the trade in using this standard.

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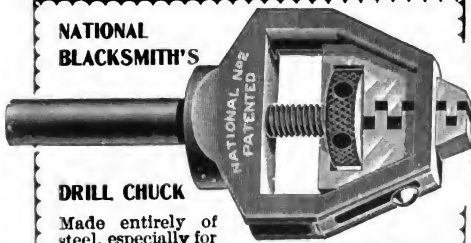
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## EMERY WHEELS CUT QUICK

A wheel that will do the work in one-fourth to one-half less time is by far the cheapest in the long run. A wheel that will save only one hour per day during your busy season would pay for itself in full.



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They're made  
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\$5.00 will bring following to your shop, value \$18.50:—One \$5.00 package Sterling Brazing Compound for cast iron. One \$5.00 package Sterling Brazing Compound for wrought and malleable iron. One \$5.00 package Sterling Brazing Compound for steel. The brazing compounds are for use in the forge and will do over \$100.00 worth of work. Also one \$2.50 package Sterling Welding Compound. This package mixed with 100 pounds clean fine sand makes 100 pounds of good welding compound. One \$1.00 package Sterling Tempering Compound for tempering fine tools, springs, etc. Just think of it, all the above for only five dollars, express money order. This offer will not appear again and only 1000 sets will be sold at this price so if you want one better send to day.

To A. B. WAYCHOFF, Culver, Kans.  
\$18.50 worth for \$5.00.

# "The Australasian Coachbuilder & Wheelwright."

A Monthly Illustrated Technical Journal circulating amongst Coachbuilders, Wheelwrights and Blacksmiths throughout the Commonwealth of Australia, New Zealand and South Africa.

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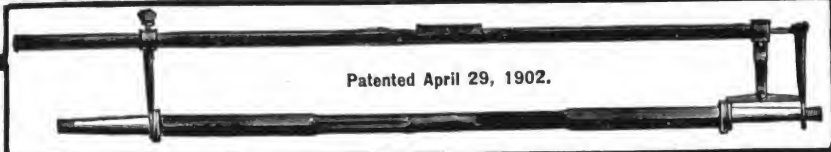
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Simple, accurate and durable. Your equipment not complete without one. Give this Gauge close examination. Best material and workmanship guaranteed. Beam is the very best tubing; one inch in diameter, six feet long. Pivot arm, gauge plate and indicator all of solid brass. Self adjustable to any length or size of axle.

This Superior gauge is sold by dealers everywhere and always gives perfect satisfaction.

If your dealer cannot supply you write to us for our liberal thirty day free trial offer.

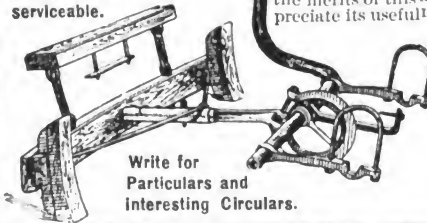
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# KELLER ECCENTRIC BRAKE

Warranted to lock wheels with three ton load with ease; can be applied to any wagon. Works without aid of ratchet. Made in two sizes.

Note its construction, sturdy and serviceable.



Write for  
Particulars and  
Interesting Circulars.

Blacksmiths, wagon and buggy repairers especially, will see at a glance the merits of this axle cutter and appreciate its usefulness.

It will cut a pipe, boiler tube or shaft, as little or as much as desired and do its work accurately, taking the merest shaving from the end or cut in two at any point, its bearings being all on one side of the knife. Attractive propositions offered to live agents.



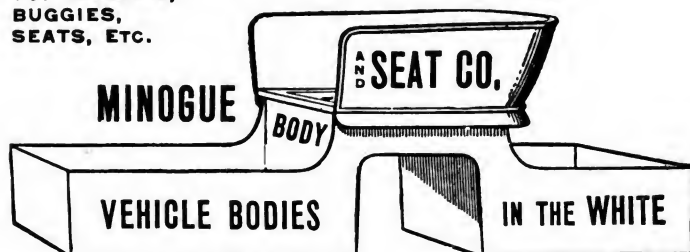
Rod,  
Pipe and  
Axle  
Cutter

Write  
for  
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Keller Mfg. Co., SAUK CENTRE, MINNESOTA.

FOR CARRIAGES,  
AUTOMOBILES,  
SPRING WAGONS,  
TOP WAGONS,  
BUGGIES,  
SEATS, ETC.

KANSAS  
CITY,  
MO.



WRITE FOR PRICES

"THE BEST IS NONE TOO GOOD"

**WE GUARANTEE**

OUR

**"COLUMBIAN"**  
**ALL-STEEL ANVILS**

to be so constructed as to stand the most rigid test of long and severe service.

**SUPERIOR  
QUALITY**



**REASONABLE  
PRICES**

These anvils are built on scientific lines and have that "true ring" which superior quality alone can produce. Made of special steel, by the most skilled workmen. We not only claim that they are the most durable but place back of each and every anvil a WRITTEN GUARANTEE.

**DROP US A POSTAL FOR INTERESTING VISE  
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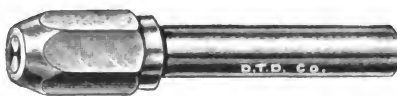
**THE COLUMBIAN HARDWARE CO.**

MANUFACTURERS

CLEVELAND, OHIO, U. S. A.

### WHY NOT BUY A CHUCK

That will fit the spindle of your drill press, holding drills  $\frac{1}{8}$  to  $\frac{1}{2}$  in. inclusive, with reducer to  $\frac{1}{4}$  in. Drills held by this chuck are much cheaper than drills with  $\frac{1}{8}$  in. or  $\frac{1}{4}$  in. shank. Simplest and cheapest chuck on the market.

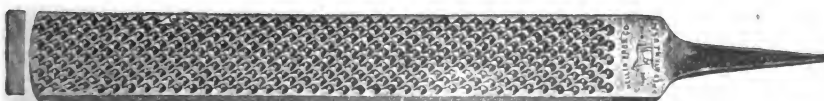


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228 21st Street, Detroit, Mich.

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### "TOOLS THAT WEAR" **HELLER'S** CELEBRATED AMERICAN HORSE RAPS, FILES AND FARRIER'S TOOLS

will save you Time and Money. Their Superior Quality sets a known and tested Standard of Excellence. All made from our own Production of Special Refined Clay Crucible Steel and Tempered by a Secret Process.



"TANGED" HORSE RASP

New Catalogue Mailed Free on Application.

**HELLER BROTHERS CO., Newark, N. J., U. S. A.**

### (A Lady can hold him.) **THE BEERY BIT**



FOUR BITS 'IN ONE

Cures Kickers, Shyers, Bolters, Pullers and Runaways.

There are four distinct ways of using it. They sell at night. Agents make big money selling them. One agent writes: "I am leaving the farm to devote my entire time to the sale of the bit." Send postal for terms to agents.

Prof. W. Beery, Pleasant Hill, Ohio.

A great many Blacksmiths are selling the bits just by showing them to their regular customers at their shops.

### Berger's Steel Pumps



These pumps are made of extra heavy annealed steel, corrugated, heavily coated, with all seams reinforced; have malleable iron fittings, cast iron cylinder. Avoids freezing by expanding.

### 20th CENTURY CORRUGATED STEEL PUMP

Gives extra hard and long service; works in deep or shallow wells; good in summer or winter. Every dealer can sell them readily. Prices and information on request.

**The Berger Mfg. Co.**  
CANTON, OHIO

### A COMPLETE LINE OF Carriage Tops

and Trimmings

Seventeen different grades of tops. All good ones. Prices right.

Ask for No. 5 Catalogue

**C. A. HALLIDAY, Oneida, N. Y.**



### The MARVEL

Combined Punch and Shear.



Double lever system makes heavy work easy. Cuts and punches iron flat, round and angle. It will pay you to investigate our machine. Write for full particulars, price.

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1195-1199 N. California Av., Chicago, Ill.

### 10,000 YOUNG MEN WANTED

To qualify for positions as RAILWAY BRAKEMEN, FIREMEN, At Salaries from \$60 to \$125 a Month We teach you by mail the Standard Rules and Modern Methods employed by leading railroads and assist you to a position when you are qualified. School conducted by prominent railroad men and endorsed by railroad managers who want our students. The greatest field today for young men is railroading. Our course is intensely interesting and fits you for immediate employment and promotion. Many positions now open. Begin at once. Write for catalog today. **THE WENTWELL RAILWAY CORRESPONDENCE SCHOOL, DEPT. 50 FREEPORT, ILL.**



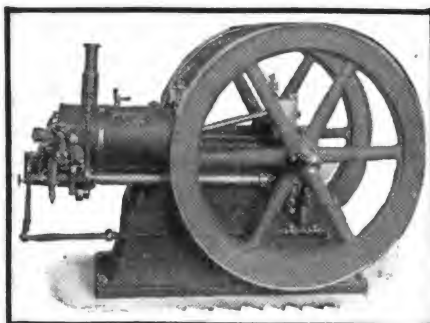
RELIABILITY



GUARANTEED

**LEAST  
Consumption  
of Fuel  
OF ANY ENGINE MADE**

Owing to the sensitive governor  
and efficient vapor mixer



6 Horse Power Weber Engine

WINNETOON, NEBRASKA.  
WEBER GAS & GASOLINE ENGINE CO.,  
KANSAS CITY, MISSOURI.

Gentlemen:—

I am using your 6 H. P. engine running an 18 inch blower on two fires, a little Giant Trip Hammer, two Emery Stands, one 225-pound Grindstone, one Tennoning Machine, one Little Giant Disc Sharpener, and a No. 7 Champion Drill. I am well pleased with it and think there is no better engine made than the Weber, and think I could run twice as much machinery with it as I am now doing before I'd use half the power it has. I advise everybody in need of power to get a Weber.

Yours very truly,  
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**EVERY ENGINE TESTED WITH LOAD BEFORE SHIPPING**

2½ to 300 Horse Power

**OUR PRICES WILL INTEREST YOU**

2½ to 300 Horse Power

**WEBER GAS AND GASOLINE ENGINE CO.**

Box V, 1114

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KANSAS CITY, MO.

New York Offices, 116 Liberty St., New York, N. Y.

## Buffalo Armor Plate Punches and Shears

**BUILT FROM ARMOR STEEL AND DROP FORGINGS**

One size,  
32 inches long.  
Punches ¼ x ¼ or  
½ hole in No. 14 plate.



**Buffalo Drop Forged Hand Punch.**—A tool newly designed throughout of exceptional value to blacksmiths and wagon builders. Solid drop forged head. Cam action. Removable punches and dies. Works close up to corners. Write for further particulars.

A favorite for  
light work.



Buffalo Pygmy  
Punch No. 12.

A special catalogue devoted exclusively to Buffalo Punches and Shears is ready for distribution.

Put your name and address on a postal and get in with the wide-awakes.



Buffalo No. 4 Combined  
Punch and Shear.  
Punches ½ x ½ and shears ½ x 3.



Giant No. 5  
Punch and Shear.

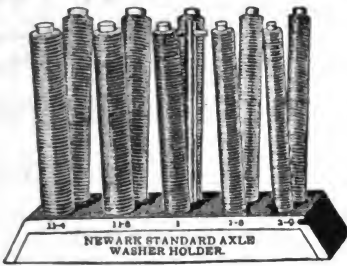
Our heavy duty machine punches ¾ x ¾,  
shears 6 in. by ½ in.

**BUFFALO FORGE COMPANY**  
BUFFALO, N. Y.

Manufactured in Canada by the CANADIAN BUFFALO FORGE COMPANY, Ltd., Montreal



# SOLID LEATHER AXLE WASHERS



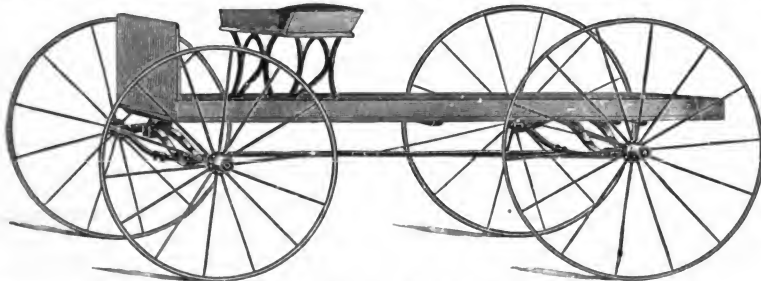
**A novelty in our Patent Axle Washer Holder. Holds 500 Newark Standard Axle Washers.** Every carriage repairman ought to have one. Handiest thing around the shop. "Standard" and "I.X.L." brands Solid Sole Leather Axle Washers are our specialty. We make washers for every axle on the market. Also a full line of

**Pump Leathers and Leather Horseshoe Soles.**

Write now for Prices, Illustrated descriptive circular and **FREE SAMPLE of Our Washers** and mention this publication.

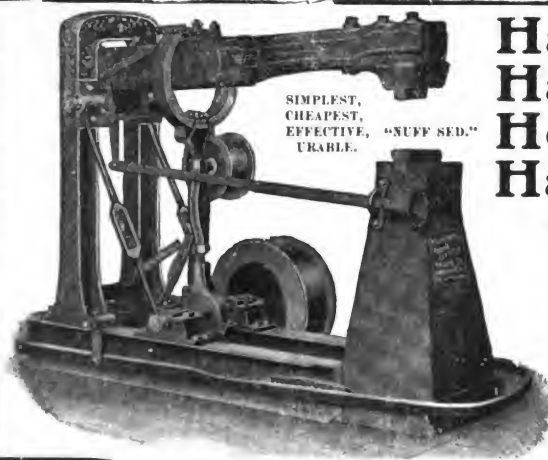
**If your dealer cannot supply you we will send you one of our racks along with 500 Standard Axle Washers, Express prepaid, on receipt of \$3.00**

**The Newark Leather Washer Mfg. Co., Newark, N. J.**



Write for Catalog and prices on full line of gears.

**PEERLESS MILK WAGON (Short turn)**  
**FORSBURG SPRING AND GEAR CO., ROME, N. Y.**



**Hathorn's Hard-hitting Helve Hammer.**

Ask your dealer or write to

**HATHORN  
FOUNDRY &  
MACHINE  
CO.  
GRINNELL,  
IOWA.**

SIMPLEST,  
CHEAPEST,  
EFFECTIVE,  
DURABLE.

## THE "BUSH" Low-down Handy Wagon

WITH 4-IN. TIRE STEEL WHEELS

Our wagons are well ironed throughout—wheels made with round staggered spokes.



We make any size wheels to fit any skein.

We manufacture a complete line of metal wheels for corn planters, cultivators, plows, etc.

WRITE TO **C. BUSH, QUINCY, ILL.**  
(MENTION THIS PAPER.)

## THE GENEVA Handy Farm Wagon

THE BEST METAL WHEEL WAGON MADE.



All Goods Guaranteed

Pressed steel wheels, any height and width tire, interchangeable hubs. Gears of selected stock, thoroughly ironed. Made in several styles.

WE ARE ESTABLISHING ONE AGENT IN EVERY TOWN.  
Send for Descriptive Circulars to

**Geneva Metal Wheel Co.**  
GENEVA, OHIO

## Let Us Send You Our Book.

about good wheels and good wagons that will save you a lot of work and make you a lot of money—the

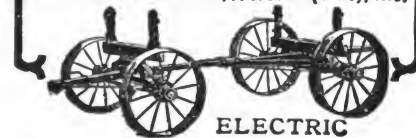
**ELECTRIC STEEL WHEELS**

—and the—

**ELECTRIC HANDY WAGON.**

By every test, they are the best. More than one and a quarter millions sold. Spokes united to the hub. Can't work loose. A set of our wheels will make your old wagon new. Catalogue free.

**ELECTRIC WHEEL CO., P. O. Box A Quincy, Ills.**



ELECTRIC

ESTABLISHED 1836

## BEALS & CO. Iron, Steel and Hardware

Tools and Supplies for Horseshoers  
and General Blacksmiths  
Carriage Hardware and Woodwork

44, 46, 48, & 50 TERRACE, BUFFALO, N. Y.

## Less Work and More Money

A GUARANTEE MADE TO USERS OF

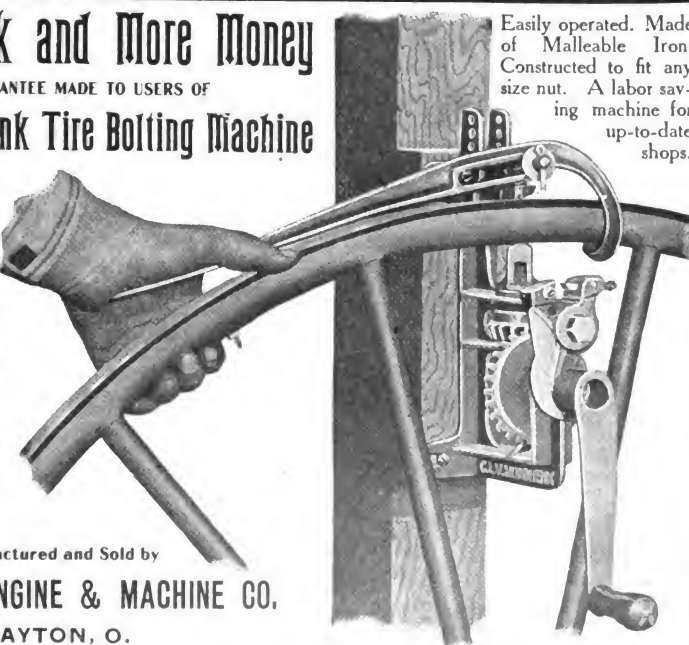
## The Mundhenk Tire Bolting Machine

Mundhenk's Tire Bolter is the Only Machine that Will Successfully Remove all Burrs, Run Them On or Clip Ends off Tire Bolt Perfectly Smooth in 2 minutes' time.

Send for one of our interesting circulars and let us tell you all about it.

Manufactured and Sold by

**RILEY GAS ENGINE & MACHINE CO.**  
DAYTON, O.



Easily operated. Made of Malleable Iron. Constructed to fit any size nut. A labor saving machine for up-to-date shops.

**STEEL STAMPS**

Steel Letters and Figures  
**BURNING BRANDS**  
Stencil Dies, Stencils, etc.

Geo. M. Ness, Jr.,  
61 Fulton St., N. Y.

Price list sent upon application.



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BOOK BINDERS

253-257 Ellicott Street, Buffalo, N. Y.

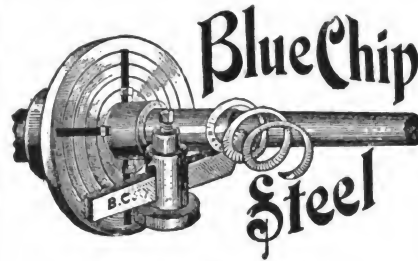
Printers of THE AMERICAN BLACKSMITH, also  
Complete Equipment for the production of Machinery  
Catalogs, Stock Farm Catalogues, College Annuals,  
and Catalogues in Foreign Languages, promptly,  
accurately and tastefully : : : : : :

## ALLEN- RANDALL BOLT CLIPPER



ALLEN-RANDALL CO., Springfield, Mass.

TRY THEM



Will turn off blue chips  
on any kind of work.

Firth-Sterling Steel Co.  
**PITTSBURGH.**

Selling Agencies :

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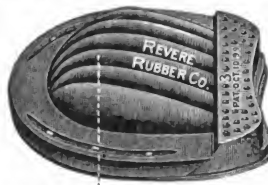
## CASH Always Secures BARGAINS and ALWAYS WILL

Special Net Price on Sarven Patent Wheels  
(C. B. 50c. extra) with steel and rubber tire

Size of tread	Price per set for wheels with flat steel tire on and hubs bored	Price per set for wheels complete with channel and rubber tire on, and hubs bored			Add to price of wheels for axles and boxes set
		36 and 40	38 and 40	40 and 44	
3/8	\$5.75	\$13.50	\$14.00	\$14.50	\$1.90 L.D.
1	5.85	14.50	15.00	15.50	1.90 "
1 1/8	6.10	16.00	16.75	17.50	2.10 "
1 3/8	8.25	24.00	25.00	26.00	2.25 H.P.

Both wheels and rubber guaranteed. Repair Wheels, \$3.50.  
PROMPT SHIPMENTS. Five set or more, one order, you  
can deduct 25c. per set as freight allowance. Write for cata-  
logue. We manufacture wheels with Steel or Rubber Tire on,  
3-4 to 4 inch tread. Buggy Gears, with wheels and shaft all  
ready for body, \$16.05 delivered.  
The A. Boob Wheel Co., Cincinnati, O., U. S. A.

## AIR CUSHION RUBBER HORSESHOE PADS



See That Cushion?

It fills with air at each step. That's what  
breaks concussion. That's what  
prevents slipping. That's what keeps the  
foot healthy. That's what cures lameness.

Twelve Different Styles



Heavy  
Leather Back

NO  
LAMENESS  
NO  
SLIPPING  
CHEAPEST  
AND  
BEST



Medium  
Canvas Back

**REVERE RUBBER CO.**

Sole Manufacturers BOSTON, MASS.

## AN AXLE

Which is coming into favor  
again is here illustrated, the



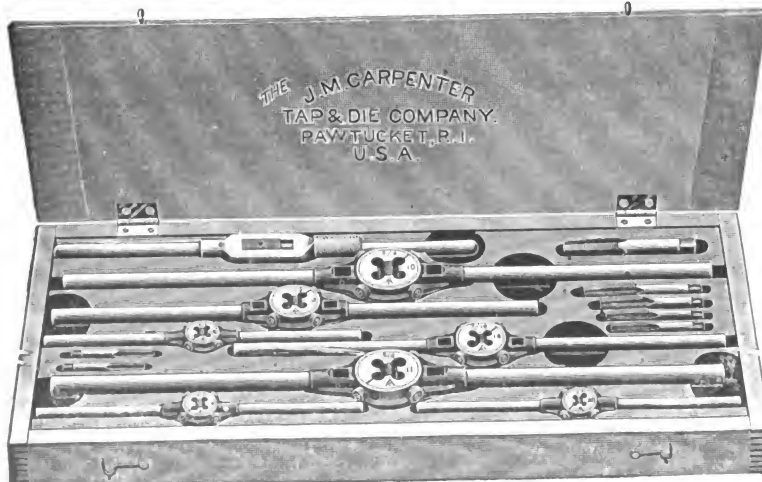
**Stivers  
Long Swell**

We make it of either iron or steel, fitted with wrought or cast box, and a variety of nuts.

If you wish further particulars  
Write to the

**DALZELL AXLE CO.,**

South Egremont, Mass.



## CARPENTER'S NEW FULL MOUNTED DIE SETS

With a stock for each die and the Original  
Nichols Tap Wrench.

Before buying a die set you should see  
**Carpenter's** and you will have no other make.

Send for catalogue

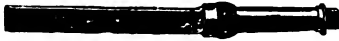
**The J. M. Carpenter Tap & Die Co.**

Pawtucket, R. I., U. S. A.

# HAYSLEIR IRON COMPANY

## KANSAS CITY, MISSOURI.

### No. 12 Half Patent Axles-Short Bed.



#### ' STEEL-DOUBLE COLLAR

5-8 x 6 in. Per set.	\$1 13	11-8 x 7 in. Per set.	\$1 44
7-8 x 6 1/2 "	1 13	11-4 x 6 1/2 "	1 75
9-8 x 6 "	1 13	11-4 x 7 "	1 75
11-8 x 6 "	1 20	11-4 x 7 1/2 "	1 75
13-8 x 6 1/2 "	1 20	11-8 x 7 "	2 75
15-8 x 6 "	1 25	11-8 x 7 1/2 "	2 75
17-8 x 6 "	1 25	11-8 x 7 1/2 "	3 60
19-8 x 6 1/2 "	1 40	11-8 x 7 1/2 "	3 60
21-8 x 6 1/2 "	1 40	11-8 x 8 "	2 60
23-8 x 6 1/2 "	1 44		



No. 2510. Hayler's Iron Co's. Horse Rasps. Order a sample, give it a trial and see if it is not just as good or better than those for which you must pay more.

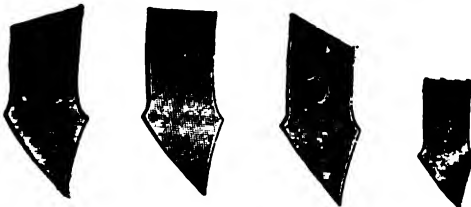
	12 in.	14 in.	16 in.
Price	25c	30c	42c



No. T 3340. Our Easy Bolt Clippers have all the latest improvements such as patent adjustment, locking device, rubber buffers, etc. They are made of the best material throughout. Jaws are high grade steel. Every clipper fully tested. Don't use small clippers on large work, you may break them; or large ones on small work, they are heavy and cost more.

No. O. for cutting bolts 5-16 in. or less, weight 3 pounds. Price \$1.88  
No. 1, for cutting bolts 3/4 inch or less, weight 4 1/2 pounds. Price \$2.08  
No. 2, for cutting bolts 1/2 inch or less, weight 7 1/2 pounds. Price \$2.86  
No. 3, for cutting bolts 5-8 inch or less, weight 12 1/2 pounds. Price \$4.60

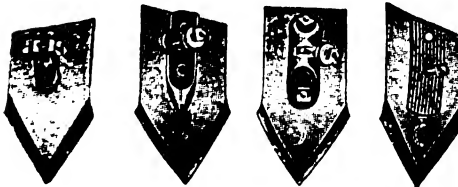
### Steel Cultivator Blanks.



Drawn, shaped and polished, no holes.  
Made of Genuine Crucible Cast Steel with extra heavy upset points.  
3 1/2 inch wide, each - - - - - 15c  
5 inch wide, each - - - - - 18 1/2 c  
3 1/2 inch blanks are right and left crook.  
5 inch blanks are straight, right and left crook.

### Complete Cultivator Blades.

3 1/2 and 5 inch Straight, and Right and Left.



With No. 410 Back on. Takes Round Standard 1 to 1 1/4 in. diameter.  
With No. U Back on. Applies to any Slotted Standard with Convex Front.  
With No. 5 Back on. Applies to any Slotted Standard with Concave Front.  
With Special Back for Wood Standard.

Complete as shown, with backs and bolts ready to use. These shovels have extra heavy points and are full polished, made in both Crucible Cast Steel and Soft Center Steel. Always specify which style back is wanted.

#### PRICES

Crucible Steel:		
3 1/2 in., 6 to set, per set	- - - - -	\$1 65
5 in., 4 to set, per set	- - - - -	\$1 50
Soft Center Steel:		
3 1/2 in., 6 to set, per set	- - - - -	\$2 50
5 in., 4 to set, per set	- - - - -	\$2 25

### Power's Pattern Fire Pot.

No. T 1240. This fire pot can be used on most of our tuyere irons. It prevents the fire from spreading and produces a compact, bright heat. It reduces the quantity of coal required and protects the tuyere iron. Weight about 2 1/2 lbs. Each - - 75c.



#### Blank

#### Plow

#### Lays.

12-inch, Solid Cast.	Price, each	\$0.45
14-inch, Solid Cast.	Price, each	.55
16-inch, Solid Cast.	Price, each	.65
12-inch, Crucible Cast.	Price, each	.53
14-inch, Crucible Cast.	Price, each	.65
16-inch, Crucible Cast.	Price, each	.75
12-inch, Soft Center.	Price, each	1.20
14-inch, Soft Center.	Price, each	1.35
16-inch, Soft Center.	Price, each	1.50

The above shares are very heavily upset on land-side edge.



### Haysler Blank Lister Shares.

NEW PATTERNS PERFECT SHAPES  
Crucible Steel, 14 inches. Each - - \$0.75  
Soft Center Steel 14 inches. Each - - 1.75  
Filled and Bolted Lister Lays, finished ready to bolt on, for any Lister in the market.  
14 inch Crucible Steel. Each - - \$0.95  
14 inch Soft Center Steel. Each - - 2.25

### Some of Our Prices

Every article we sell is sold on the same small margin of profit as shown by these prices. Our big No. 61 Catalogue contains 146 pages of bargains of interest to every blacksmith, wagon maker and machinist. This catalogue will be sent you absolutely free. We want every blacksmith in the west to have one.

#### WRITE FOR IT TO-DAY

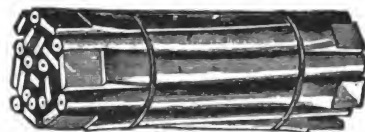
We do only a mail order business. We have no drummers, we do not lose any money on account of bad debts and when you buy from us you don't help pay some one else's bills.

Our No. 61 catalogue is the most complete blacksmiths' supply book ever published and it's free for the asking. Write for it to-day.

### Mower Sickles.

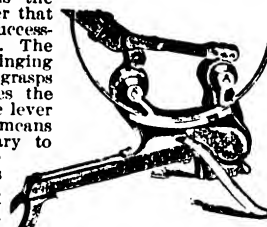


We carry every kind of implement repairs and supplies. Our catalogue gives dealers' prices. Write for our book to-day.



Spokes of every kind at much lower prices than you are now paying.

No. T 970. It is the only Tire Shrinker that can be operated successfully by one man. The operation of bringing down the lever grasps the tire and does the work; raising the lever opens it. By this means it is not necessary to remove the tire until it is upset as much as required. It is especially made for heavy wagon and truck tires. It is very powerful, having a long lever.



#### MOLES

Size In Stock	Net Price, Each	
No. 1, for 2-inch tire, each	- - - - -	\$3.12
No. 2, for 3-inch tire, each	- - - - -	6.00
No. 3, for 4-inch tire, each	- - - - -	9.00

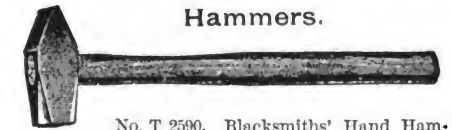
### No. 11 Half Patent Axle-Square Beds.



#### STEEL-DOUBLE COLLAR

3/4 x 6 1/2 in. Per set	\$1 88	11-16 x 6 1/2 in.	\$1 75
1 1/8 x 6 1/2 "	1 88	1 1/8 x 6 1/2 "	1 75
1 1/2 x 6 1/2 "	1 88	1 1/2 x 6 1/2 "	1 75
1 3/4 x 6 1/2 "	1 50	1 3/4 x 6 1/2 "	2 18

#### Hammers.



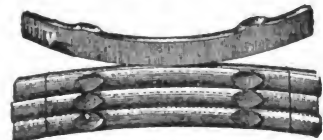
No. T 2590. Blacksmiths' Hand Hammers, extra fine steel; fully warranted; handle not included in weight.

No.	1	2	3	4	5
Weight -	2 lb.	2 1/2 lb.	3 lb.	3 1/2 lb.	4 1/2 lb.
Price -	47c	50c	54c	59c	65c

Our line is the most complete and our prices the lowest in the United States.

### Bent Hickory Rims

Width.					
3/8 in., 1 in. deep; per set	- - - - -	- - - - -	- - - - -	- - - - -	\$0.80
1 in., 1 1/4 in. deep; per set	- - - - -	- - - - -	- - - - -	- - - - -	.85
1 1/4 in., 1 1/2 in. deep; per set	- - - - -	- - - - -	- - - - -	- - - - -	.90
1 1/2 in., 1 3/4 in. deep; per set	- - - - -	- - - - -	- - - - -	- - - - -	1.00
1 3/4 in., 1 3/4 in. deep; per set	- - - - -	- - - - -	- - - - -	- - - - -	1.20
1 3/4 in., 1 3/4 in. deep; per set	- - - - -	- - - - -	- - - - -	- - - - -	1.40
1 3/4 in., 1 3/4 in. deep; per set	- - - - -	- - - - -	- - - - -	- - - - -	1.60



### Dry Finished Oak Felloes.

Size 1 1/4 in., tread 2 1/4 in. deep, regular height 3 ft. 8 in. and 4 ft. 6 in.; per set - - - - - \$1.60

#### ROUGH SAWED FELLOES

1 1/4 x 2 1/4, any height, per set - - - - - \$1.20

#### Tire Bolts.

1 1/2 x 3-16, per 1000	- - - - -	\$1.35
1 3/4 x 3-16, per 1000	- - - - -	\$1.46
2 x 3-16, per 1000	- - - - -	\$1.58



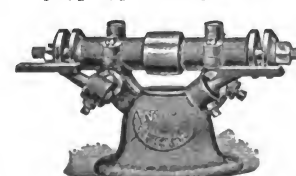
### Emery Wheels.

Best in the market. All sizes in stock. 2 x 12, each \$3.15.

2 x 14, each	\$4.38
1 1/2 x 12 "	\$2.41
1 1/2 x 14 "	\$3.39

### Finished Oak Tongues.

Finely finished, straight and clear, sizes 3 x 3, 3 1/2 x 3 1/2, 3 3/4 x 3 3/4, each - - - - - \$1.00



Suitable for saw gummy and light work of all kinds. Has long bearings and is a first-class tool in every way. Spindle 1 x 18 in. Diameter of spindle between flanges, 3 1/2 inches. Bearings, 4 inches. Pulley, 2 x 2 1/2 inches. Diameter of flanges, 3 inches. Distance between wheels, 12 inches. Weight 40 lbs. Price \$4.95. Carries two wheels, 12 x 1 1/2 inches.



Buggy Tops, Cushions, and Trimming Goods of every kind.



# DON'T BUY GASOLINE ENGINES

Has a wider sphere of usefulness. Has little or no vibration. Can be placed anywhere without expense for foundation. Weighs less than one-half the weight of one-cylinder engines. Please give size of engine required. We make 2, 4, 6, 8, 10, 12 and 16 horse-power. Please mention this paper. Send for catalogue.

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72p. Book Mailed Free.  
R. S. & A. B. LACEY, Patent Att'ys, Washington, D. C.

ESTABLISHED 1869

### Why Not Stop Your Troubles?

A Wizard Tubular Does It.



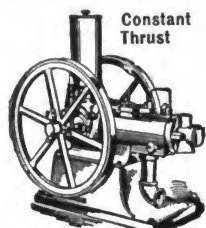
Armature incased in WATER-PROOF non-corroding brass tube. All brass screws. Friction, Belt or Governor drive. Brush-holders removed without loosening screws. All parts polished brass. Contact and Jump Spark. A TRIAL WILL CONVINCE YOU. Most popular and satisfactory Magneto on the market. Price as popular as Machine.

GOVERNOR DOES AWAY WITH BATTERIES AND SWITCHES.

HERCULES ELECTRIC & MFG. CO.  
INDIANAPOLIS, INDIANA.

Write for catalogue and SPECIAL OFFER.

## The MIETZ & WEISS Oil and Gas Engines



Constant Thrust

STATIONARY and MARINE  
1-60 H. P.

Adopted by the U.S. and Foreign Governments. Most Economical and Safest Power known. Runs with common kerosene, distillate or fuel oils.

It will pay you to consult me before placing your order elsewhere.

For all Power Purposes. Thousands in use. Highest award for Direct Coupled Engine and Dynamo, Paris Exposition, 1900.

Gold Medal, Pan-American Exposition, 1901.  
Gold Medal, Charleston, S. C., Exposition, 1902.  
Gold Medal, Louisiana Purchase Exposition.

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## ANOTHER LABOR-SAVING TOOL FOR BLACKSMITHS



Weight, 570 lbs.

### No. 6 "BADGER" No. 6

Combined Hand Power Punch and Shear. Easily operated by one man on the lever bar. Punch  $\frac{1}{2}$  inch hole in  $\frac{1}{2}$  inch material. Shear,  $\frac{1}{2}$  inch x 4 inch flat bars. 1 inch round bars.

Besides this machine, we make a full line of Punches and Shears, both HAND and POWER, for all kinds of work. We will be pleased to have you write us for Catalogue and Prices.

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Horizontal 5, 10, 12, 15, 20, 25, H. P.  
Designed and Built for BUSINESS.  
Catalogue on request.

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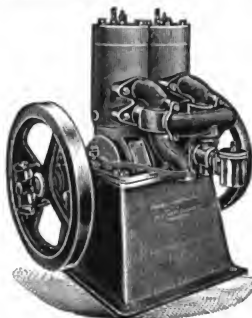


The Goodson Igniter is guaranteed to produce a sufficient spark to start a gas or gasoline engine without batteries or spark coil.

Send for Catalog.

Goodson Electric Ignition Co.

95 Point Street, PROVIDENCE, R. I.

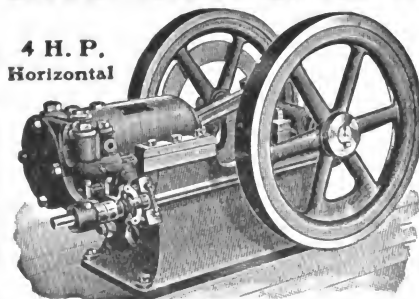


### The Maxwell & Fitch Gasoline Engine

Two cycle, a power impulse every revolution, we use no gears, cams, cam shafts, valves or valve springs, no engine can be simpler or more durable. If you want a well built engine, one built of the best materials, then just send us a postal for our catalogue and price list.

THE MAXWELL & FITCH CO.  
ROME, N. Y.

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4 H. P.  
Horizontal

Also equipped with pumping attachments. Write for booklet describing full line New Era Gas Engines from 4 to 100 H. P. Special inducements to dealers as agents.

### THE NEW ERA GAS ENGINE CO.

No. 63 Dale Ave., DAYTON, OHIO.



### The Beaver

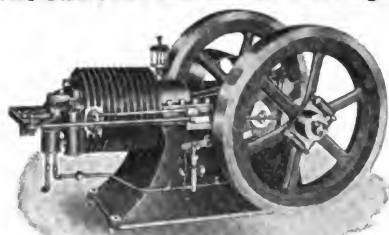
3½ & 6 H. P.  
gasoline engine all complete ready to

run. Can be moved anywhere.

Agents Wanted. Write Us.

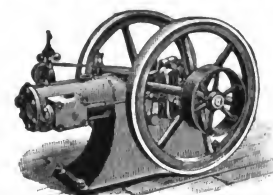
BEAVER ENGINE CO. 222 East 2nd Street, CINCINNATI, O.

## The GADE Air Cooled Gasoline Engines



Made in 2, 3 and 6 horse power sizes. What's the use of paying good money for an old style engine, when you can get something better in the "Gade Air Cooled" at the same cost. Buy one. It will not freeze up or go back on you in cold weather. It's ready for business all the time. We know it will please. By all means write for descriptive circulars and price list of the "Gade." Address, GADE MFG. CO., Iowa Falls, Iowa.

## THE ENGINE THAT MEETS THE DEMAND OF THE DAY



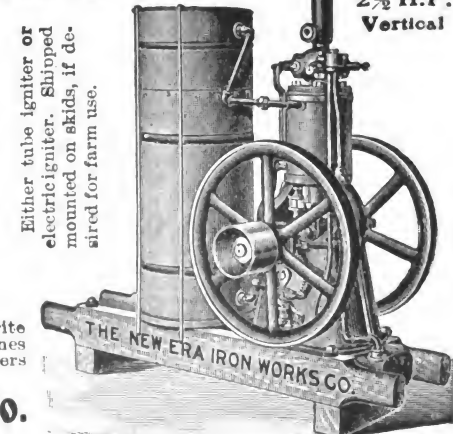
## THE "WATKINS"

It has always been our aim to build the best engines possible, regardless of cost, and to systematize their manufacture that they can be sold at a fair price. All sizes from 2 to 15 H. P.

OUR CATALOG IS AT YOUR SERVICE.

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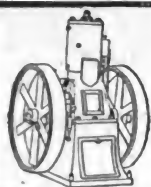


2½ H. P.  
Vertical

Either tube igniter or electric igniter. Shipped mounted on skids, if desired for farm use.

THE NEW ERA IRON WORKS CO.





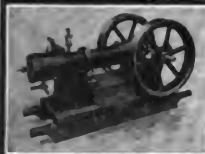
## KEROSENE ENGINES

*Safe, Sure, Simple, Reliable and Efficient. Most Economical Power in the World. Especially Adapted for Shops Using Small Power. Cheaper and Safer than Gasolene. No Sparker. No Igniter.*

WRITE FOR DESCRIPTIVE CIRCULAR AND PRICES.

WHITEHALL ELECTRIC CO., 32 Park Place, N. Y.

## THE "ELI" LEADS 'EM ALL

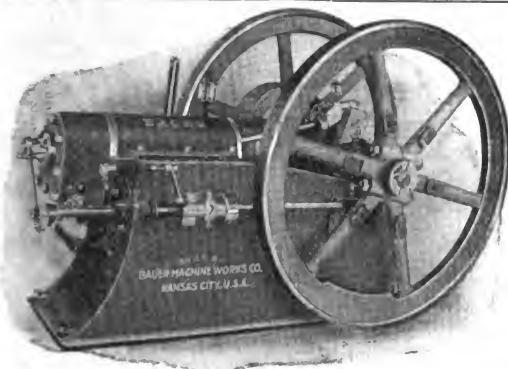


### THE "FOOL-PROOF" GASOLENE ENGINE

The "ELI" Gasolene Engine is the only fit engine to have on a farm, where one is a good way from the repair shop. The "ELI" is so simple that there's nothing to get out of order. It will run year in and year out without the tinkering that other engines require. It is the only engine without cams, gears, and levers. We call it "Fool-Proof" because, if some simpleton or a child should monkey with it, he couldn't make it dangerous. It is absolutely safe. Isn't that the kind of an engine YOU want? Then write for our free booklet, telling how and why it is so simple and safe.

MOLINE PUMP COMPANY, Sole Mfrs..

MOLINE, ILL.



## BAUER GASOLINE ENGINES..

The Acme of Simplicity and Perfection.

If you will examine and compare, piece by piece, you will say there is no other quite so good as the "Bauer." All sizes from 1½ to 20 H.P. Write at once for free catalogue containing long list of letters from satisfied users. Our prices are also very interesting, considering quality.

THE FIRST BLACKSMITH in any town who buys of us gets the agency for his locality, a discount on his purchase, and a commission on his sales. A good engine sells readily. The Bauer is the best.

Write us Today.

Bauer Machine Works Co.

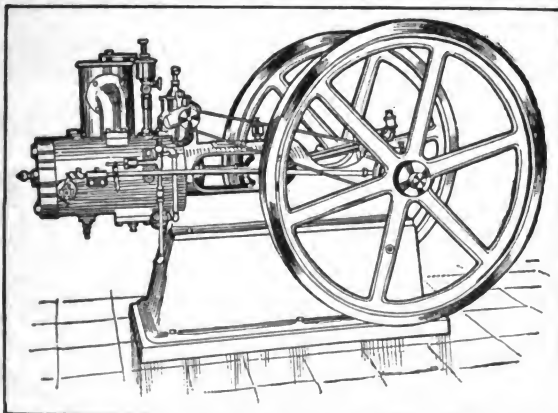
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## Dempster Gasoline Engines

SIMPLE, DURABLE, SAFE

Two Cycle Type. Smooth Running, Practically No Vibration.

2  
— TO —  
30  
H. P.



BUILT  
TO  
WORK

READY FOR BUSINESS ANY TIME.

OUR LINE: WINDMILLS, PUMPS, TANKS, WELL MACHINERY, GASOLINE ENGINES, GRAIN DRILLS, CULTIVATORS

DEMPSTER MILL MFG. CO. Beatrice, Neb.

## IT DOES THE TRICK! R. F. D. SPECIAL



This axle runs easier than any other, and requires no attention. "It's a Wonder." STANDARD BALL AXLE WORKS, Lancaster, Pa.

## BUILD YOUR OWN GASOLENE MOTOR



We supply the castings, drawings and all accessories. A complete line of rough castings, also finished Motors for Bicycle, Automobile, Marine or Stationary. A 2-cent stamp gets our catalogue.

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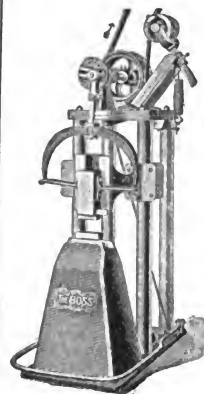


## NOVELTY IRON WORKS

### BOSS HAMMER

For Plow Work, Wagon Work, Heavy Work, Any Work.

G. E. DAVIS, Mgr.  
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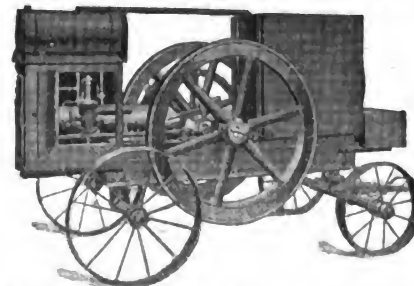
If so, *The Practical Gas Engineer* will tell you how to get the best results from it. A plainly written book telling how to erect, operate and care for gas and gasoline engines. Cloth bound, 152 pages. Sent prepaid, for \$1.00.

AMERICAN BLACKSMITH CO.

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## The Flour City GASOLINE ENGINES

TRACTION = PORTABLE = STATIONARY



KINNARD-HAINES CO.

MINNEAPOLIS, MINNESOTA



Remember

"MILTON"

The price will interest you

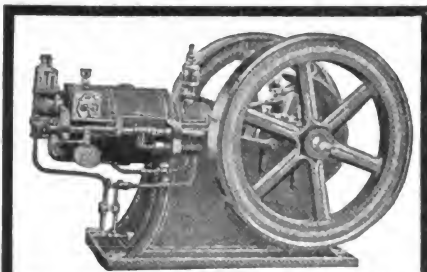
MILTON MANUFACTURING CO., MILTON, PENNA.

COLD  
PUNCHED

NUTS

Give satisfaction always.

No. 1.



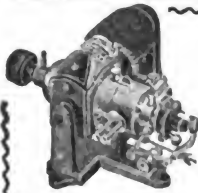
### RELIABLE POWER

New model and Michigan gasoline engines for blacksmith and machine shop work. Every part guaranteed and illustrated in our catalogue, which is sent free to those interested.

We make a very favorable price on the first engine in any locality and the best of terms for agents who sell and advertise our engines.

Our book called "Proof Positive" tells how our engines are being used and where we have replaced other engines with ours. 2 to 6 horse power. Get catalogue today. Nothing like them on the market.

The Nation Engineering Co., Saginaw, Mich.



To Gas Engine Operators.  
Dynamo Ignition.

### Motzinger Auto-Sparker

No battery to start or run. The original speed-controlled friction-drive Dynamo. Driven parallel with engine shaft. No belts. No beveled pulley or beveled fly wheel necessary. For nake and break and jump-spark system. Water and dust proof. FULLY GUARANTEED.

We have an attractive proposition for the Dealer in Gas Engine lines. Correspondence solicited.

Write for 32-page catalogue, FREE.

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Direct connected, has been designed especially for the blacksmith, and it is his ever ready helper that works for less than five cents a day, and never tires. It places him on an equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.

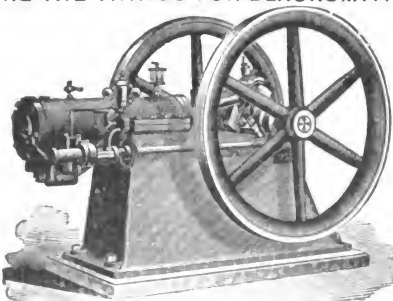
NEW ERA ELECTRIC CO.

Write for circular and particulars.

942 W. Lake St.  
CHICAGO.

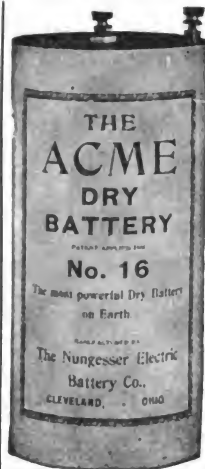
### COLUMBUS GASOLINE ENGINES

ARE THE THINGS FOR BLACKSMITHS



Send for Catalogue 33, Stating Horse Power You Need.

COLUMBUS MACHINE COMPANY  
Columbus, Ohio.



## Don't Hesitate—Just Buy The No. 16 Acme

Absolutely the most reliable Dry Battery manufactured for ignition.  
Its long life means marked economy.

MANUFACTURED BY

The Nungesser Electric Battery Co.  
CLEVELAND, OHIO.

General Sales Office, 128 West Jackson Boulevard,  
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It's the  
**SPARK**  
that  
**COUNTS**



**YOUR ENGINE** will work better, give you less trouble and carry a bigger load, if you ignite with one of our **Improved Mueller Spark Coils**.  
Furnished for use with batteries or dynamo. WE GUARANTEE our coils against all imperfections in workmanship and material.  
If your engine doesn't ignite properly, write us. Information cheerfully given. Correspondence solicited.

INDUCTION COIL CO.

9-10-11 MILLER BLDG. MILWAUKEE, WIS.

## Perfect Cooling with Small Water Supply

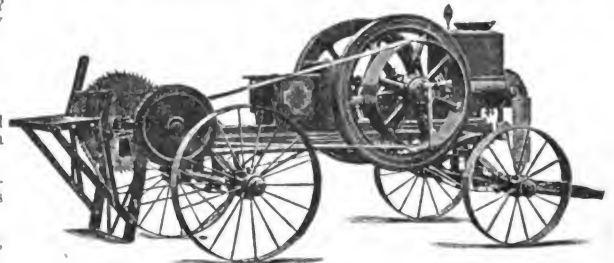
Attractive proposition, isn't it?  
This is only one of the many SPECIAL features found on the

### "EASY STARTING" LAUSON LINE.

5, 6 and 8 H; P. Self-Contained Hopper Cooler. 6 to 20 H. P. with Improved Screen Cooler.

Write for 1905 Catalog and Dealers' Discounts. Mention this paper.

STATIONARY and PORTABLE, with or without Saw Attachment.



"LAUSON" SPECIAL, with Saw Attachment.

THE JOHN LAUSON MFG. CO., New Holstein, Wis.

## OTTO ENGINES

### Less Repairs and Less Fuel

It is what an engine costs to *keep it running* that cuts the big figure and not the *first cost*. The St. Anthony & Dakota Elevator Co., Minneapolis, Minn., writes: "In April, '02, we had 92 'OTTO' engines running, all of which gave better satisfaction, cost less for repairs and consumed much less fuel than any others we had tried. During the season of 1902 we bought 35 more 'OTTOS' and now have 127 of them." A splendid testimonial to the merits of the "OTTO" from people who have tried many others.



OTTO GAS ENGINE WORKS, Phila., Pa.  
STANDARD OF THE WORLD

10 Lights  
10 Hours  
10 Cents

### Make Your Own Light

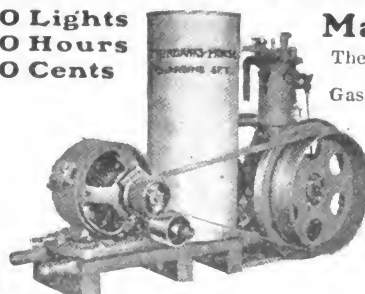
The FAIRBANKS-MORSE Electric Light Outfit gives plenty of good light at a moderate cost.  
Gas, Gasoline or Kerosene Engines for all purposes, from 2 h. p. up.

Cut out complete advertisement and send to  
**Fairbanks, Morse & Co.**  
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Please send me Illustrated Catalogue No. C 487 Gasoline Engines.

I may want..... h. p. to run.....

Name..... Street No.....  
Town..... State.....



## THE WATERLOO BOY

Our Blacksmith's Special  
3½ to 4 H. P.

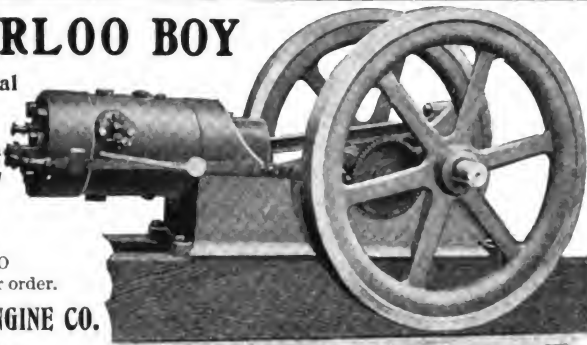
### GASOLINE ENGINE

The Engine Is Right!  
The Price Is Right!

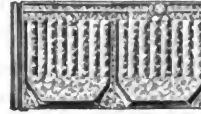
Investigate the WATERLOO  
before placing your order.

**WATERLOO GASOLINE ENGINE CO.**

WATERLOO, IOWA

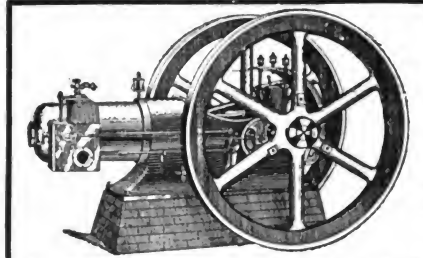


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With Montross Telescope Side-Locks is the best roofing in the world for house or barn. Storm proof. Easily applied. Catalogue, Prices and Testimonials free for the asking.

Montross Metal Shingle Co., Camden, N. J.

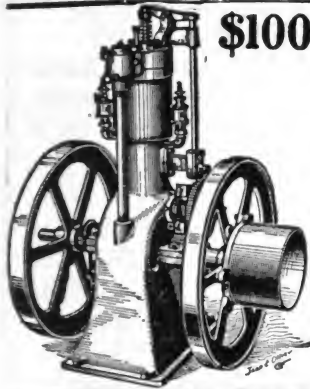


Why buy an experimental gas engine, when for the same money you can buy one that has stood the test for twelve years, and have the further advantage of being able to use it either with gasoline or kerosene. Built in sizes of from 2 to 100 H.P. Write for our large catalogue and prices, if interested.

**MODEL GAS ENGINE WORKS**

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New York Office, B-21 Produce Exchange.



## \$100 The New Pierce Gasoline Motor IS A WONDER.

It will develop more power on less fuel  
than any other make in the world.....

Built on modern lines and up to the very latest practice; made from the best material, and with ordinary care will last a life-time.

We have been building Gasoline Motors for over twenty years. More than 12,000 PIERCE MOTORS are in use in all parts of the world. We know how to, and do, build them right, in fact, we

**Guarantee Them to Give Satisfaction.  
If they do not, send them back and we  
will refund your money in full. . . .**

The PIERCE MOTORS are the best in the world and cost less than the poorest. We guarantee them against defective material for life. If you want power for any purpose, write for our printed matter, stating your needs. We also build other sizes up to 100 H. P., also Marine Motors, Launches and Auto Boats. Be sure and address

**PIERCE ENGINE COMPANY, - Dept. 8, Racine, Wis.**

3 1-2 Actual Horse Power.

## THE SINNING GAS ENGINE

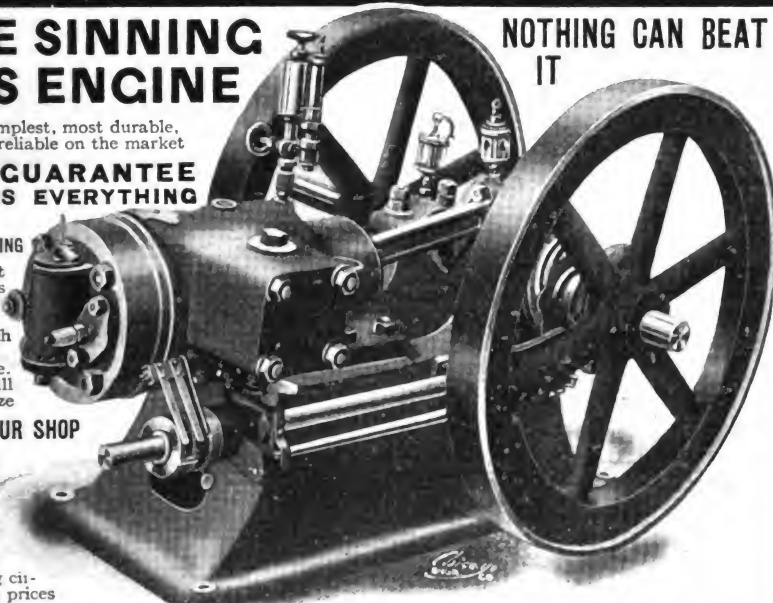
Is the simplest, most durable,  
and most reliable on the market

**OUR GUARANTEE  
COVERS EVERYTHING**

THE SINNING  
is cheapest  
to run, has  
few working  
parts, all of  
which are  
interchangeable.  
Bearings all  
hard bronze

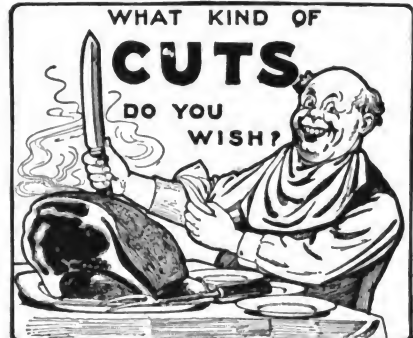
**EQUIP YOUR SHOP  
with the  
VERY  
BEST**

Write for  
interesting cir-  
culars and prices



NOTHING CAN BEAT  
IT

**THE CHARLES SINNING MACHINE WORKS 242 DICKSON STREET  
ST. LOUIS, MO.**



WHAT KIND OF

**CUTS**

DO YOU  
WISH?

- CUTS** for Circulars, showing exactly what is needed.
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Three-Color Half-Tones a specialty.

**ASK TO SEE SAMPLES OF OUR WORK.**

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Cor. S. Division and Ellicott Sts.  
BUFFALO, N. Y.

## ONLY ONE TO A CUSTOMER

AT THIS SPECIAL LOW SAMPLE ORDER PRICE



**\$50.00** buys a RUBBER TIRED BUGGY. Fine  
Leather Top. Tires Warranted.

RUBBER TIRED RUNABOUT for only **\$40.00**  
Quality, Material and Workmanship Fully  
Guaranteed. At These Special Prices f.o.b. Cars, Cincinnati.



REFERENCES:—Bradstreet's or Dunn's Mercantile Agency. All inquiries promptly answered. Write for catalogue and information.

**The Hickory Carriage Company**

(INCORPORATED)

MAKERS OF STANDARD GOODS

**SOUTH STREET**

**CINCINNATI, OHIO**



A Good Set of Bit Brace Nut Wrenches is almost a necessity. A postal sent to us will bring net delivered price.



Do you want a Screw Plate cutting  $\frac{1}{4}$  to  $\frac{3}{4}$ ? Now is a good time to buy. Send for price delivered to nearest R. R. Station. CATALOG FREE

## DON'T BUY A SCREW PLATE

—Until you know what the "REECE" IMPROVED SCREW PLATES cost and have heard our arguments in their favor. It Pays to look around before you buy and find out all you can about the different makes. You will find that the "REECE" SCREW PLATES have more points of **REAL MERIT** than any other kind. You will find that you always get about what you pay for. Low prices mean cheap goods. Our prices are not excessive and when you get a "REECE" SCREW PLATE you get one that will cost only a trifle more than a cheap screw plate and outwear two of them. Quality counts every time.

SOLE MANUFACTURERS  
**THE E. F. REECE CO.,**  
GREENFIELD, MASS., U. S. A.

## Cortland Welding Compound Co. CORTLAND, N. Y.

Manufacturers of

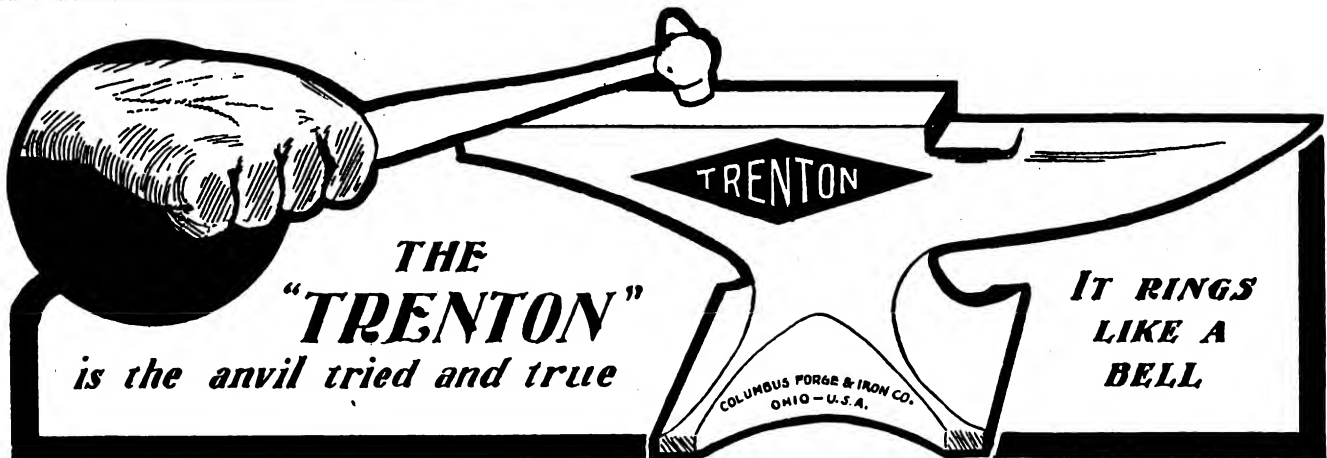
**Climax Welding Compound,  
Cherry Heat Welding Compound,  
and BORAX--ETTE.**



**B**ORAX-ETTE makes steel weld easily. It does not have to be applied between the laps like other compounds, but is used the same as borax. It has no equal for all kinds of steel welding.

**SAMPLES FREE.**

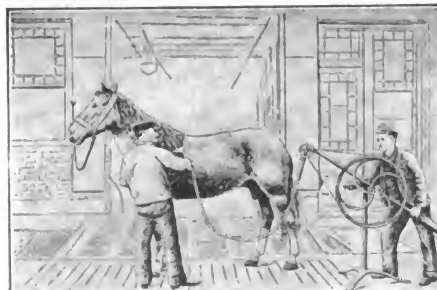
FOR SALE BY DEALERS IN **BLACKSMITHS' SUPPLIES**



## The Celebrated Gillette Horse Clipping Machines

The Guarantee we give you with our Machine is as good as a U. S. Gold Bond.

We are so far in advance of other Machines in improvements that we really have no competitors. Gillette Machines give satisfaction in every way.



Our claim is as broad as words can make it. The Gillette Clipping Machine is better than any other Clipping Machine in every particular.

The Gillette Machines were the first Horse-Clipping Machines made in any part of the world; many imitations have been put on the market, but none have ever reached our high standard.

Write us for our Catalogue.

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NEW YORK, N. Y.





## Potters Spring Brake Blocks

For Vehicles of all kinds with STEEL OR RUBBER TIRE.  
Have a record of excellency for seventeen years. **• • •**

**The MORGAN POTTER CO.**

SOLE MANUFACTURERS.

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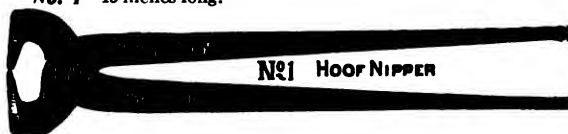
FISHKILL ON HUDSON, N. Y.



THE W. T. CO'S.  
HOOF NIPPER  
BEATS THEM ALL

## THE TWO LEADERS!

No. 12—Hoof Trimmer, 12 inches long, fully polished and packed one in a wooden box.  
No. 1—13 inches long.



NO. 1 HOOF NIPPER

All our tools are hand made out of tool steel. We will send either size, express prepaid, upon receipt of \$1.25, or both for \$2.25, to any part of the United States, if unable to get them from your jobber.

Address **WASHINGTON TOOL CO., Owatonna, Minn.**

Manufacturers of the Celebrated Larson Placers and the No. 12 Hoof Trimmers.

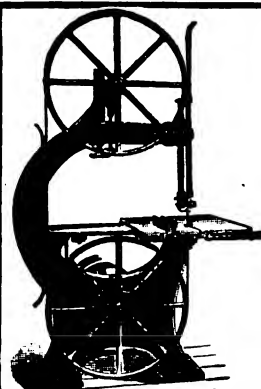
## WE ARE IGNITION SPECIALISTS

If you have any trouble with your ignition, write us about our

### APPLE AUTOMATIC SPARKER

Gives a strong, steady current that never fails. No trouble to put on any car or engine; our friction driving gear makes installation easy. See that your entire car has an Apple electrical equipment. For full information write

THE DAYTON ELECTRICAL MFG. CO.,  
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Wood Working Machines in your Shop will enable you to do better work and more of it than you can do with hand tools.

We Build Just the Machines You Need.

Catalog describing a fine line of moderate priced **BAND SAWS, SAW TABLES** and **JOINTERS** mailed for the asking.

Send for it now.

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245 Main St.

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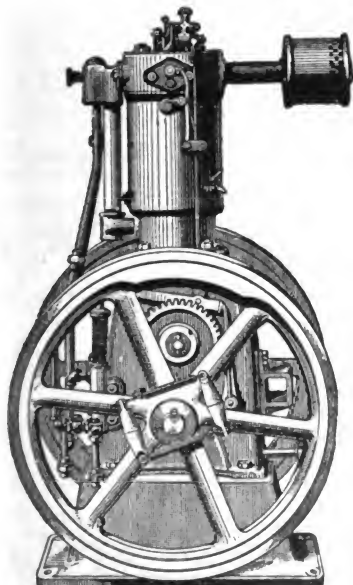
Look like the original and bring results. Furnished complete with names filled in or ribbons to match.

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363 Washington St., BUFFALO, N. Y.

## I. H. C. GAS OR GASOLINE ENGINES.

A number of meritorious features characterize I. H. C. engines, and we've put them in a booklet, which we would be glad to send you if you ask for it.

I. H. C. gasoline engines are not only safe, but also inexpensive to operate. A bright ten year old boy can handle an I. H. C. engine, because the parts are so few, simple and easily controlled that it practically runs itself.



Moreover, I. H. C. engines do not require an engineer, there is no danger of an explosion, and the operating expenses are reduced to a minimum. With a given quantity of gasoline, I. H. C. engines will generate the maximum efficiency of driving power.

I. H. C. engines are substantially constructed, have few working parts, are not liable to get out of order, and will remain serviceable for many years.

The diversity of purposes for which these engines can be used makes them available as power producers wherever an engine of the same rated capacity is required.

Made in the following styles and sizes:

Horizontal, Stationary and Portable, 6, 8, 10, 12 and 15 H. P.  
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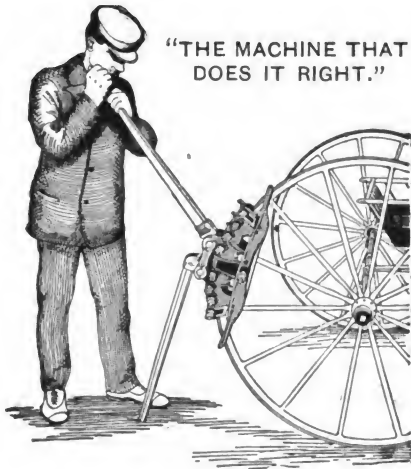
Write us for illustrated catalog.

**INTERNATIONAL HARVESTER COMPANY OF AMERICA.**

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7 U. MONROE STREET, CHICAGO, U. S. A.

# SCHAU TIRE SETTER



"THE MACHINE THAT  
DOES IT RIGHT."

3,000  
in use  
in the  
United  
States  
and  
Canada

Write for Catalogue.

## BURTT MFG. CO.

Kalamazoo, Mich.

# An Attractive Offer

is here made to get you acquainted with our rapid selling specialties. Blacksmiths and wagon men all over the country are making nice profit by selling our goods, with no trouble at all. Only a few specialties are shown here.



The Wabash Safety Trace Holder is a dandy. Safe, convenient. Can be worked in dark or with gloves.

Harsh's Dash Line Holder is a convenience every vehicle owner appreciates.



I·X·L

For 50 Cts.

We will send you postpaid

1 pair IXL Anti-Rattlers,  
1 pair Safety Trace Holders,  
1 Dash Line Holder.



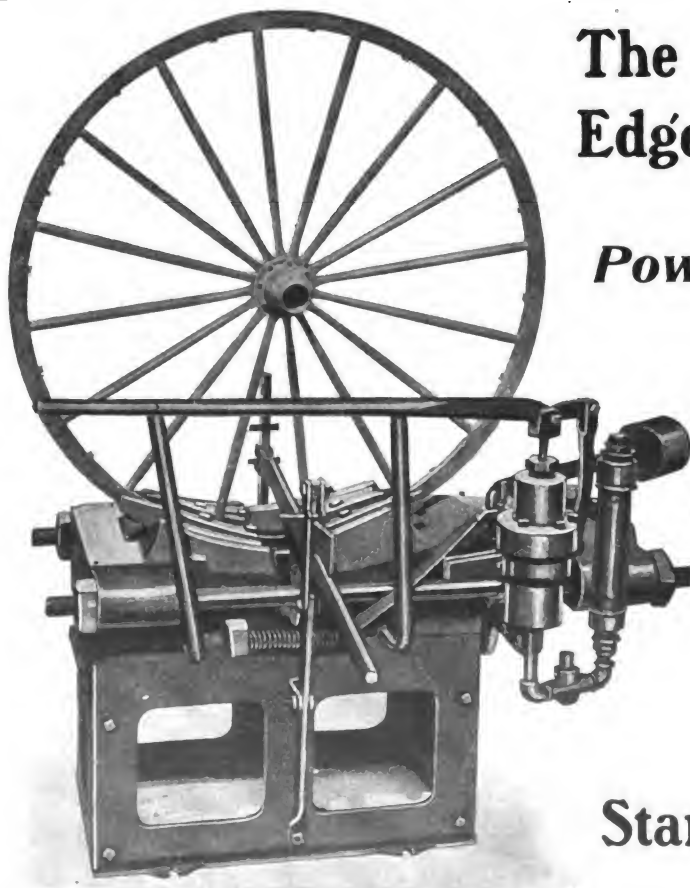
Our IXL Anti-Rattlers are easily put in and are guaranteed to stop rattle of pole or shaft.

For \$1.25, we will send postpaid a dozen pair of single safety trace holders, or For \$1.50, one dozen pair of double safety trace holders. **WRITE TODAY.**

Write for our Circulars and Price List.

## Lauder, Harter & Harsh Mfg. Company

20-30 So. Miami St., Wabash, Ind.



# The Scientific, Hydraulic Edge Grip Cold Tire Setter

Sets tires cold by a few strokes of a

## Powerful Hydraulic Pump

### The Warranty Tells the Tale

It is warranted to work as well in every respect, or better, than any other edge grip tire setter, and in addition is warranted to work much

### EASIER AND QUICKER

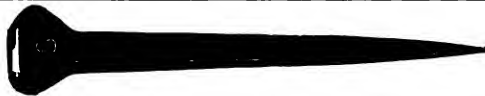
These are two most valuable points in a hand power cold tire setter.

Its gripping jaws grip the tires accurately and let go quickly without the use of a hammer.

For full information, address,

## Standard Tire Setter Co.

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No. 8 REGULAR HEAD.—Exact size.

**“NEW STANDARD” HORSE NAILS**

The letter “S” appears on the head of each nail.



No. 8 CITY HEAD.  
Exact size.

**Best Nail in the World BAR NONE.**

**DEALERS' NET PRICES TO SHOERS.**

No.....	5	6	7	8	9	10	11	12
Box.....	\$4.75	4.00	3.75	3.50	3.25	3.25	3.00	3.00
Lb.....	.19	.16	.15	.14	.13	.13	.12	.12

FOR SALE BY ALL DEALERS.

Uniform Horse Nails. In length, breadth, thickness, blades, points, quality and PRICE, and the best driving and holding nail ever produced.

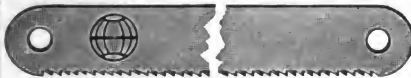
We mean every statement made above.

Manufactured and Guaranteed by

**STANDARD HORSE NAIL CO., New Brighton, Pa.**

**Your Hack Saw Troubles**

will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



**West Haven Manufacturing Co.**  
NEW HAVEN, CONN.

**NATIONAL SELF-OILING STEEL TUBULAR AXLES**

Now made  
of high  
carbon steel.



Guaranteed to be stronger and more rigid than solid steel axles. We make both. Write us

**National Tubular Axle Co., EMIGSVILLE, PA.**



**ATTENTION!**

We want you to represent us in your locality selling

**The Victory Corn and Feed Mills.**

Oldest and Best Grinding Mill Made. **STRONG, SIMPLE, DURABLE.** Especially adapted to grinding ear corn, shelled corn, wheat, oats, rye, etc. Write for Prices and Particulars today.

**THOMAS ROBERTS,**  
(Established 1876.) **Springfield, Ohio.**

**ELECTRIC FORGE BLOWERS**

**EXCEL ALL OTHERS**

A GOOD  
BLOWER  
THAT  
BLOWS  
EVERY  
BODY  
GOOD



Write  
for  
Prices  
and  
Circulars

MODERN MACHINERY  
MAKES THE SMITH'S  
WORK  
LIGHTER

**ROTH BROS. & CO.**

27-29 So. Clinton Street,  
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ARTISTIC  
HORSESHOEING**

**MY LATEST BOOK  
ARTISTIC HORSESHOEING  
SHOULD BE IN EVERY UP-TO-DATE SHOP.  
THE PROGRESSIVE SMITH**

will find it invaluable in his every day work. A practical, scientific treatise on improved methods of shoeing. Special directions given for correcting faulty action in trotters and for shaping shoes to cure different foot diseases. 284 different styles of shoes illustrated and explained. *Cloth bound, 217 pages, Price \$2.00.*

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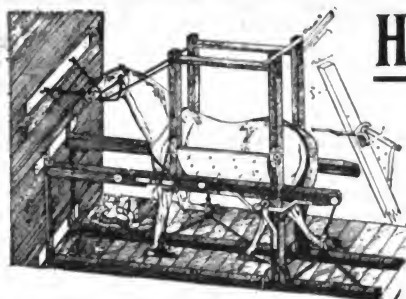
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**STEEL**

Kept in stock at Cleveland for immediate shipment,  
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SEE MONTHLY STOCK LIST.

**THE  
BOURNE-FULLER CO.  
IRON, STEEL  
PIG IRON  
COKE  
Cleveland, Ohio.**



# Hemphills

## New Shoeing Stocks

### Read What Users Have to Say

Newark, Ohio.  
"I have bought one of Hemphill's Shoeing Stocks and it operates to my entire satisfaction and I am more than satisfied with it in every way. I have shod stallions weighing 2200 pounds, who fought from start to finish and could do no harm to themselves or my men."  
THEODORE LOWENDICK."

### THE BEST!

Why?

Because they are the strongest, they will not break and need no repairs. There are no cogs, springs or dangerous cranks about them. Can be used in any building, as there is no strain whatever on the walls. We do not use a vise-like clamp to hold the foot and there is no danger of the horse straining his leg.

The shoulder rope can be secured instantly and it holds the horse so that he can not rear up or get away. When he is shod he is released by simply pulling a lever, which drops the sling. These two features are most essential in a shoeing stock but are not found in any other machine. No trouble to set up or use them. Low prices and liberal terms.

Write for further particulars.

**M. L. HEMPHILL, Rensselaer, Ind.**

To Try One is to Buy One and Don't You Forget it,  
You Will Never Regret it.

The Top Notch of Satisfaction  
is attained  
in our line of

# BADGER GAS AND GASOLENE ENGINES

STATIONARY,  
PORTABLE,  
TRACTION,  
MARINE.

## THEY ARE UNEXCELLED

For great power at low fuel consumption.

For quiet and smooth running qualities.

For general reliability and easy starting.

For regularity of speed and close regulation of power.

We do not make a cheap engine, but cater to that class of buyers who wish a first-class article, something that will not mean continual trouble and repairs. A cheap engine is a very expensive machine at any price.

We want blacksmiths everywhere to act as agents for this, the most complete, successful and best money-making line of gasolene engines on the market.

Every engine sold on trial, satisfaction guaranteed. Write at once for exclusive agency, prices and terms.

Handsome 48 page Catalog Free.

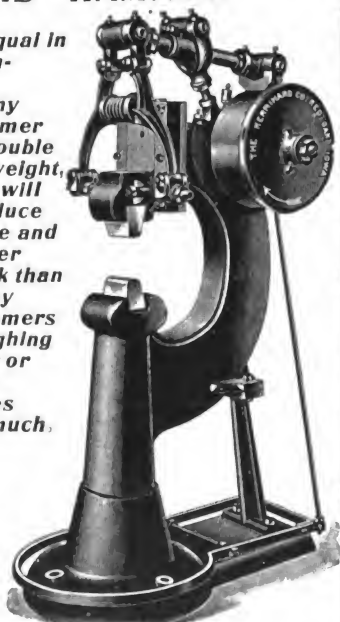
## C. P. & J. LAUSON,

MANUFACTURERS.

101 W. Water Street, MILWAUKEE, Wis.

### THIS HAMMER

Is equal in capacity to any hammer of double its weight, and will produce more and better work than many hammers weighing four or five times as much.



Height over all . . . 55 inches  
Floor space . . . 18x30 inches  
Height to top of anvil block, 31 in.  
Weight . . . 700 pounds

## Kerrihard's Power Hammer

DESIGNED AND CONSTRUCTED FOR SHOP USE

We use every care in its manufacture. A perfect system of jigs and templates insures all parts being interchangeable and enables us to produce a high grade machine AT A PRICE MUCH LOWER than that asked by other makers.

The material is the very best. We have combined the well-known principles of the helve and direct-acting hammers in such a way as to eliminate the objectionable features of each and secure the advantages of both. The main frame casting is in one piece with anvil, with the metal in the proper place to withstand the jar of the hammer. The hammer head is machined and securely fastened to the main casting, with provision for taking up wear. All shafts and pins subject to wear are of hammered steel. The eccentric strap is of best bronze. The stroke of the head is adjustable from 3½ inches to 9 inches and is so arranged that the hammer head is always the right distance from the anvil on the downward stroke, a feature that will be appreciated by all users. The friction clutch is new and is the best clutch for the purpose yet produced. It has but three parts, and is therefore not liable to get out of order. It controls the hammer to perfection by foot pressure.

Write for interesting and descriptive circulars and price list. Sent free upon request. Write us to-day



### OUR 1905 EMERY GRINDER

Meets the demand for a comparatively cheap but handy floor grinder. Will carry wheels 20 inches in diameter and 3 inches thick or smaller with a 1¼ hole. Strongly built for long and hard service. Steady and true running. Write for particulars.

With every machine we send a neat wrench for removing the bolts and nuts, a feature not found with other Grinders.

THE KERRIHARD CO., RED OAK, IOWA.





### HENRICKS MAGNETO

*Fires your gas or gasoline engine without the aid of batteries.*

It is better and more durable than any Dynamo. Its Governor regulates the speed regardless of speed of Fly Wheel. Its Governor adjusts to imperfect Fly Wheels. Its Governor insures a constant and uniform spark. The spark does not burn the contacts of the engine. All strains are removed from the bearings of Magneto. FULLY GUARANTEED. AGENTS WANTED.

**HENRICKS NOVELTY CO.**

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### We Manufacture SHEARS AND PUNCHES

Hand or power, for shearing and punching plates, bars and angles. Send for Catalogue C. **BERTSCH & CO.** Cambridge City, Ind.

## GEAR EXCELLENCE!

The Best Design Material Workmanship



O. M. Milk Wagon Gear No. 251

We will exhibit both in New York and Philadelphia, and as in other years we will lead.

Our New Gear Catalogue is now ready for distribution and will be sent FREE to any one.

**SEND YOUR NAME TODAY!**

**SCHUBERT BROS. GEAR CO., ONEIDA, N. Y.**

NEWMAN 1902 MODEL

## PORTABLE

WATCHMAN'S CLOCK.



Made under the Rules and Requirements of the National Fire Protection Engineers, and Approved by all Underwriters. Simple, Accurate and Tamper Proof. In Service in Almost Every Large Plant and Institution. Gives Satisfaction Everywhere. Let us send you interesting circulars giving detailed description of all working parts. Write to-day for Circular B.

**NEWMAN CLOCK CO.,**

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CHICAGO, ILL.



## The Modern Power Hammer

is what the name implies—up-to-date in every respect.

Ask your dealer or write to us for prices and easy terms.

**Grinnell Mfg. Co.**

GRINNELL, IOWA.

### RUBBER STAMPS STEEL STAMPS AND STENCILS

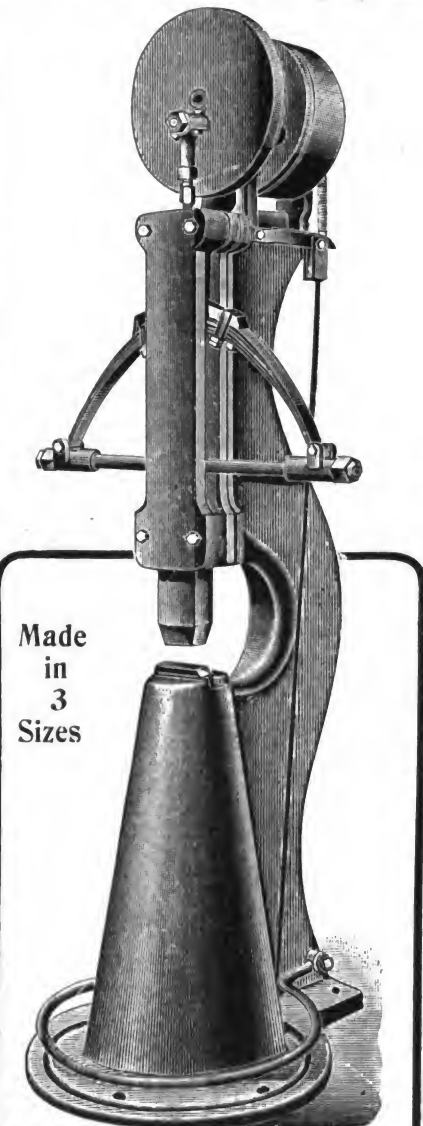
SEND FOR CATALOGUE.



**A. C. GIBSON CO.,**

338-340

WASHINGTON STREET  
BUFFALO, N. Y.



Made in 3 Sizes

### The Perfect Power Hammer

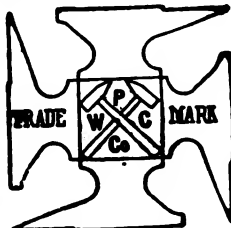
has no equal for simplicity and efficiency. Does a wide range of work from the lightest forging to heavy axle welding. Note the long guides, insuring a direct vertical stroke. No side motion. Easy to operate from the lightest tap to the heaviest blow. The Disk Attachment free. No other Hammer has this advantage. It only requires one Horse Power to run it. Write for prices.

**Macgowan & Finigan Foundry & Machine Co.**  
ST. LOUIS, MO.

**YOU WILL NEVER FAIL**

*To Make a Strong, Clean Weld If You  
Use Perfection Welding Compound.*

We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



Perfection Welding Compound will do the trick quickly and neatly. It makes a stronger weld than any other compound manufactured, as proven by the tests it has undergone. Send for free sample.

PRICE CONSISTENT WITH QUALITY.

**PERFECTION WELDING COMPOUND CO., SCRANTON, PA.**

"I look back to the olden days when the master would say 'Pump, pump, are you tired this early in the day?' Now I am old and what hair I have left is gray, but with your 200 it's easy to blow, blow, all day."

So speaks **GEORGE CHATFIELD**, of Koshkonong, Wis., about his No. 200 Buffalo Blower.

**A LARGE FREE SAMPLE**

**BANNER  
WELDING  
COMPOUND**

Pat. May 10, 1904.

Enough to give our Compounds a satisfactory Trial Test will be sent to any regular Blacksmith on request.

**BANNER BRAND  
WELDING COMPOUNDS**

Are used in the Best Shops in this Country. Always give greatest satisfaction. Save time, fuel and labor and make a solid weld every time.

**ASK  
YOUR  
DEALER**

For 3A Banner Welding Compound for General Work, and Banner Toe-Calk Welding Compound for fine Toe Calk Work.

Guaranteed to Weld at a low heat. Does not fly.  
SEND FOR A SAMPLE TODAY.

**CORTLAND SPECIALTY CO., CORTLAND, N. Y.**

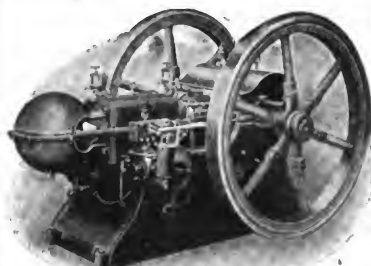
SOLE MANUFACTURERS.

**BANNER  
TOE-CALK  
COMPOUND**

Send Name and Address today.

**LIGHTNING BALANCED**

**GAS and  
GASOLINE ENGINES**



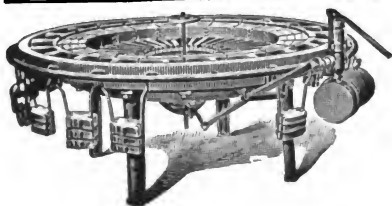
**Are Especially  
Suited for  
Blacksmith Shop  
Power.**

Write for Free Catalogue.

**KANSAS CITY HAY PRESS CO.,**

482 Mill Street,

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**INVESTIGATE****The Hercules Hydraulic**

**Before  
You  
Buy a  
Tire Setter**

**National Machine Co.**

KEOKUK, IA.

**Henderson Hand Power TIRE SETTERS**

Set Tires Cold.  
Keep the Dish right  
Tighten Wood Work  
Pull Broken Spokes  
Jump in New Spokes  
Are Money Makers



**Standard Tire Setter Co.**

KEOKUK, IA.

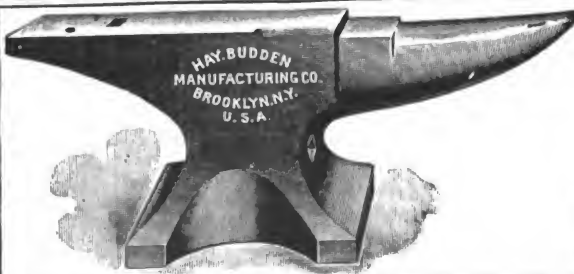
**HAY-BUDDEN SOLID WROUGHT ANVILS**

**The Gold Medal Anvil  
Highest Award**

OMAHA, 1898 PAN-AMERICAN, 1901

Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS.



**OVER 100,000 IN USE**

**WARRANTED**

Experience has proved their worth and demonstrated that "HAY-BUDDEN" Anvils are Superior in Quality, Form and Finish to any on the Market.

**HAY-BUDDEN MFG. CO., BROOKLYN, N. Y.**

# AMERICAN BLACKSMITH

BUFFALO  
N.Y. U.S.A.

A Practical Journal of Blacksmithing and Wagonmaking

DECEMBER, 1905

\$1.00 A YEAR  
10¢ A COPY

## Buffalo 200 Blower

### PRIDE OF TO-DAY'S SMITHY

Built on Modern Mechanical Principles.

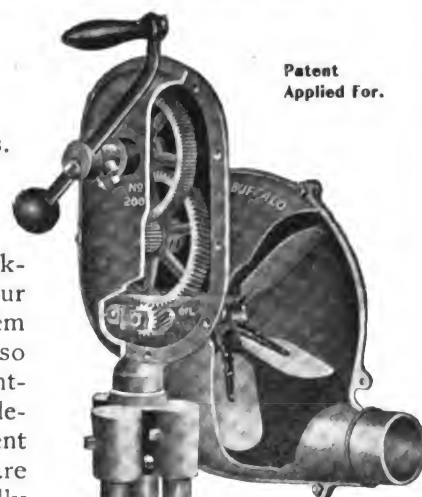
The simplicity and durability of this blower are in themselves enough to commend it to every blacksmith. The gears are of the cut spur and helical spur type, making them entirely free from the sliding friction so destructive in spiral gears. Being mounted in a rigid cast iron frame entirely independent of the casing, their alignment and smooth easy running qualities are preserved. The bearings are unusually long and bored and reamed in solid stock, so that there is no chance for the wear so common in brass boxes. The gears are protected from dust and grit by an air tight casing, in the lower part of which the high speed gears run, insuring copious lubrication for months. This is the only blower in the world in which the fan casing is adjustable for height and angle so that blast can be delivered in any direction. It is sold under a positive guarantee for five years and any part wearing out within that time will be replaced free of cost.



Gearing Used on Buffalo  
No. 200 Blowers.

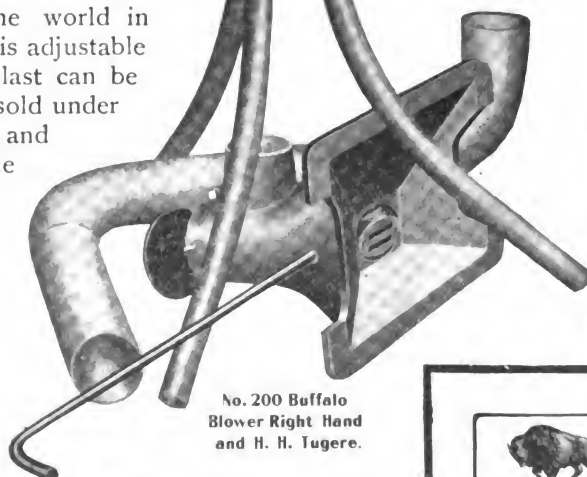
*A new Catalogue is just out, send for a copy.*

Canada friends: Save duty, buy of  
The Canadian Buffalo Forge Com-  
pany, Ltd., Montreal, Quebec.



Patent  
Applied For.

Made Right Hand  
and Left Hand.



No. 200 Buffalo  
Blower Right Hand  
and H. H. Tugere.

**BUFFALO FORGE COMPANY, BUFFALO, N. Y.**



# Carriage Maker and Blacksmith Tools

Special  
Prices to  
Carriage Makers  
and Blacksmiths  
if this paper  
is mentioned.



Fig. 900, 12 inches.

**Fig. 900, "Elite," Silver Blower** (patent applied for) is distinctive in design, has cut gearing and removable, interchangeable bronze bearings for gear pinions. The gearing is self contained and attached to side of fan case, has an outer bearing plate over it and is thus permanently secured so that there is no unnecessary friction or lost power. The gear covering is removable without disturbing the gearing or paddle spider. There is a light tuyere for clay lining and a heavy one to use without lining. All parts are interchangeable.

**Fig. 822, Band Saws** are made in sizes 20 and 26 inch for foot or belt power and 32 and 36 inch for belt power. They are properly constructed, nicely finished, adapted to factory and repair work of every kind and give unusual satisfaction.

**Fig. 718, Spoke Tenon Machine** cuts tenons  $\frac{1}{8}$  to 2 inches diameter up to 6 inches long and also bores the fellowe.

**Fig. 709, Taper Hub Boxing Machine** is made as illustrated, on legs and also without legs to mount on bench. It bores tapering holes in the hubs for the boxes and cuts the recesses for nuts and collars.

Made also for hand and power.

Also Forges, and a complete line of Hand and Power Drills.

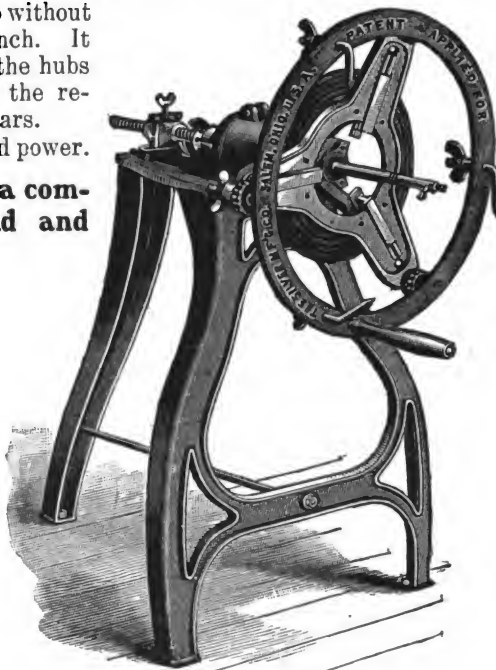


Fig. 709.

Manufactured by

— THE —  
**SILVER MFG. CO.,**

365 Broadway,

SALEM, OHIO.

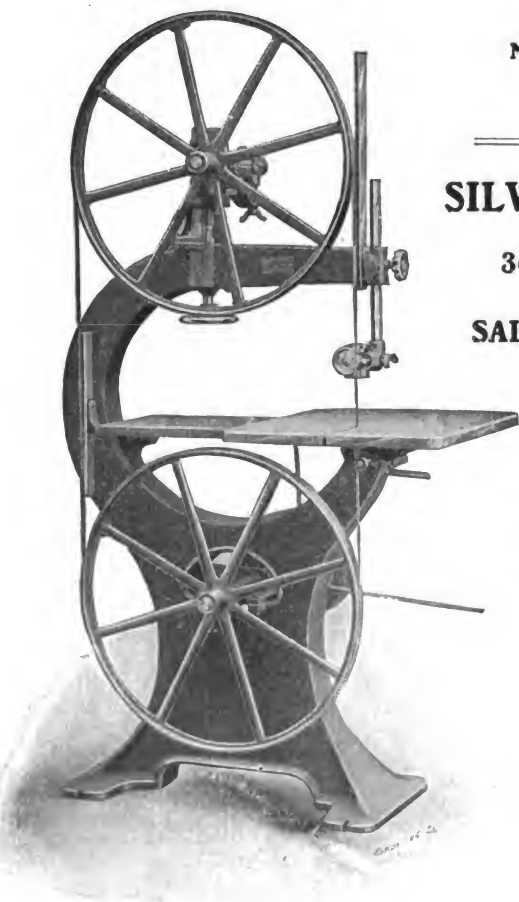


Fig. 822, 32 inch.

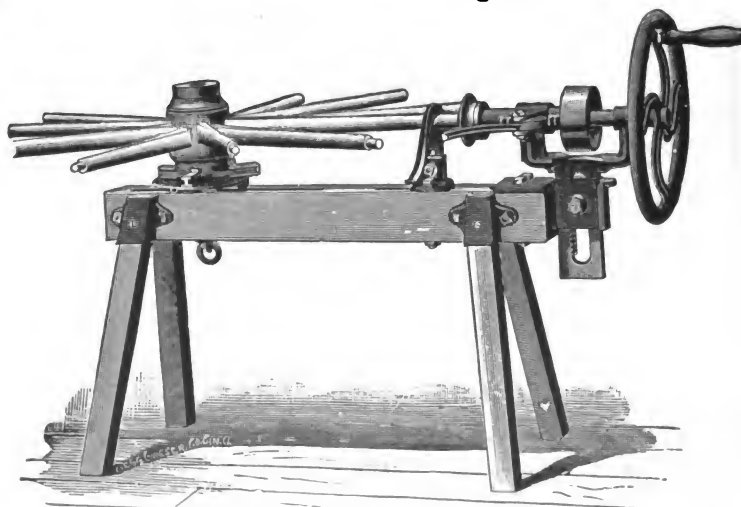
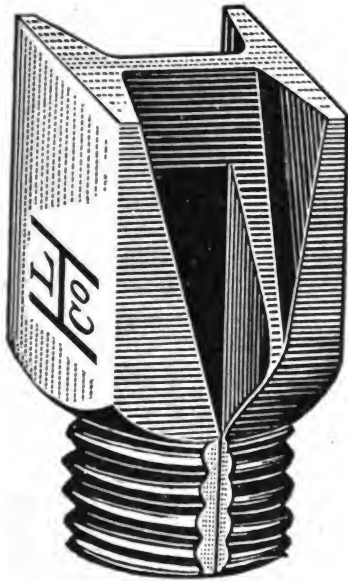


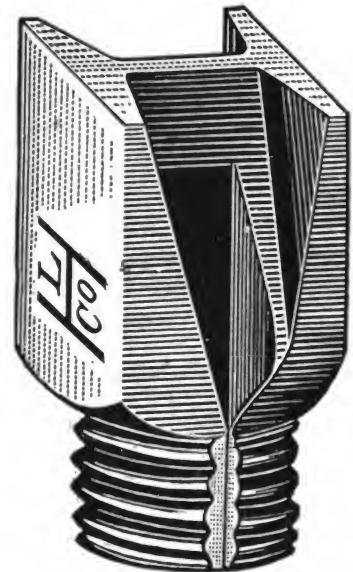
Fig. 718.



# PATENT



# H



# CALK

**ALWAYS SHARP! NO SLIPPING OF THE HORSE.**  
**NO INJURIES AS CAUSED BY OTHER CALKS!**  
**GREAT SAVING OF HORSES AND HORSESHOERS.**

**Guaranteed to Outlast Every Other Device of  
The Kind.**



**WHEN NEW!**

**Can be Removed Even if Worn  
Down to the Shoe.**



**HALF WORN!  
Always Sharp!**

**H Calks have been  
in use over  
25 years**

**Sold to Horseshoers  
Only**

**H Calks have saved more  
horses than all other de-  
vices of the kind together**

**THE ONLY INSERTIBLE HORSE SHOE CALK USED IN THE  
GERMAN, RUSSIAN AND AUSTRIAN ARMIES.**

**Write for Circulars and Price List.**

## H CALK CO.,

**16 Beaver Street**

**NEW YORK CITY**



## Capewell Horse Nails are the Leading Nails of the World and the Best

THE BEST FOR ALL CLASSES OF WORK



"CUTE" THE GUIDELESS WONDER, 2-04  $\frac{3}{4}$

The Capewell Horse Nail Co.,  
Hartford, Conn.,

Dear Sirs:—

In regard to the shoeing of "CUTE" I will say that I always do the work myself. "CUTE" wears a four ounce bar shoe in front fastened with a No. 4 Capewell nail and a three ounce bar shoe behind fastened with a No. 3 Capewell nail, and although she has paced over all kinds of tracks in all parts of the country, 176 miles in 2,10 and faster, she has never lost a shoe in one of these miles.

I have been using Capewell Horse Nails for the past ten years. They have given me the best of satisfaction and I cannot say too much in their praise. I CONSIDER THEM THE ONLY PERFECT HORSE NAIL.

Yours Respectfully,

V. B. STRONG.

Made by **The Capewell Horse Nail Company**  
**HARTFORD, CONN.**

The Largest Manufacturers of Horse Shoe Nails in the World

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Baltimore: 6 East German St.  
Buffalo: 11 Ellicott St.  
Cincinnati: 720 Main St.  
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Mexico City: Apartado, 2377.

Chicago: 238-240 Randolph St.  
St. Louis: 12-14 North 12th St.  
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San Francisco: 636 Mission St.  
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CORRUGATED PATTERN.



ALL OVER THE WORLD!

# The 1902 CHICAGO CLIPPER

**Price, \$10.75**

"Stewart's Patent" is recognized as the Greatest Clipping Machine ever invented.

More of them are sold every day ten times over than all other makes combined. Each one is sold under a positive guarantee to clip faster and turn easier than any other machine made, regardless of price, or money refunded. All gearing is cut from solid metal, and unlike any other machine made, it can be turned with either the right or left hand.

**IT'S EASY MONEY**

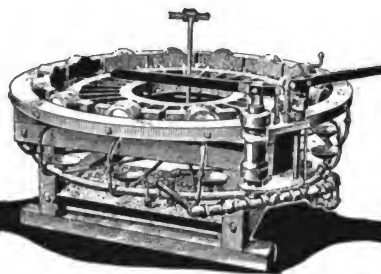
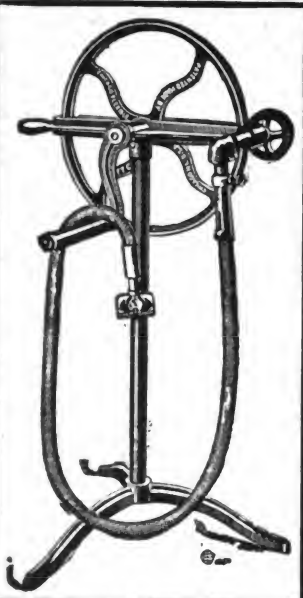
blacksmiths make using this clipper. Horse clipping is now a part of every up-to-date horse shoeing establishment. Why, look at the profit. You can clip a horse in 30 minutes with this machine, and every horse owner recognizes the advantages of clipping.

Send \$3.00 and machine will be sent C. O. D. for the balance.

Catalog on request.  
Yours very truly,

## Chicago Flexible Shaft Co.

186 Ontario Street, CHICAGO.



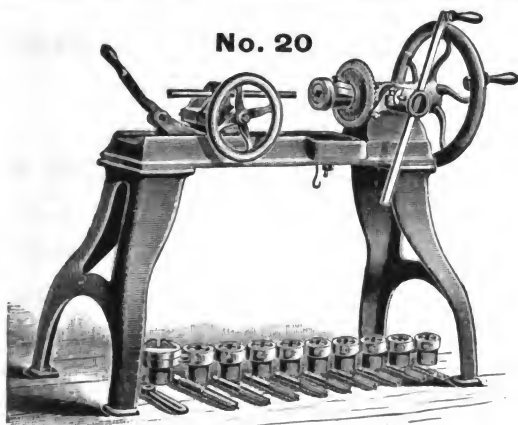
## The New Way

Is better not because it is new, but because it gives more durable work at a far less cost and with a saving of 600 per cent. in time. The new way to set a tire is with the

## West Tire Setter.

This machine consists of powerful hydraulic rams set around a circle and operated by a pump. It is possible to place a pressure of 50 tons on each of the 18 rams of the No. 3 machine if you want it, or as much less as is required (an automatic pressure check stops the pressure at the right moment). Any manufacturer or repair man will find The West the greatest money maker he ever had anything to do with.

THE WEST TIRE SETTER CO., Rochester, N. Y.



No. 20

Write for Catalog and get our Latest Offer to Blacksmiths, Carriage Makers and Repair Men.

MADE BY

## WILEY & RUSSELL MFG. CO.

Greenfield, Mass., U.S.A.

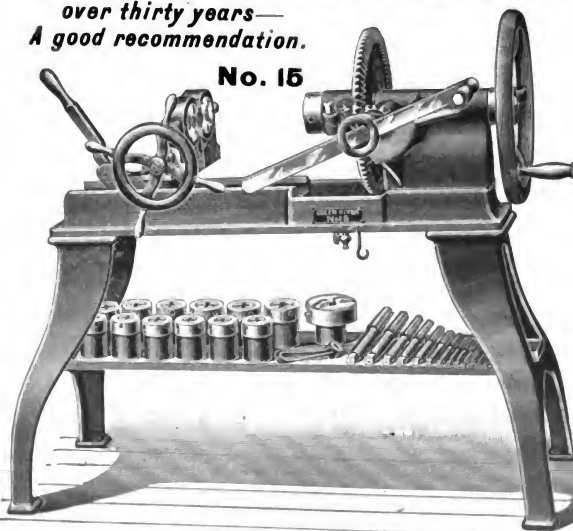
ALSO MAKERS OF TAPS, DIES, SCREW PLATES AND ALL KINDS OF BLACKSMITHS' TOOLS.

## GREEN RIVER BOLT CUTTERS AND NUT TAPPERS

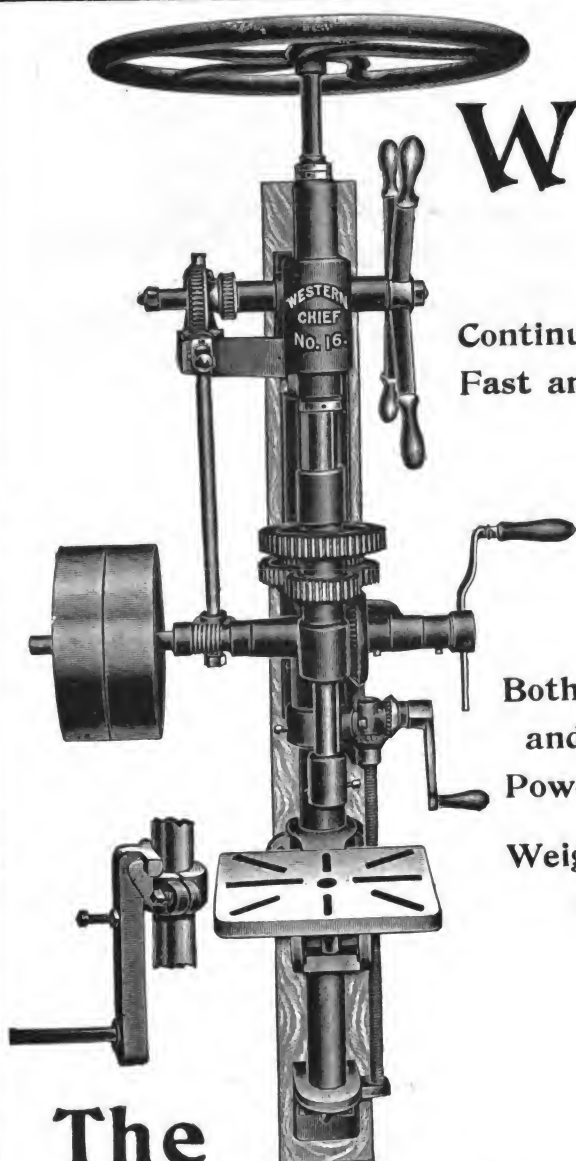
### Strong and Reliable

Hundreds of our Machines have been in use for over thirty years—  
A good recommendation.

No. 15



# No. 16 Western Chief DRILL



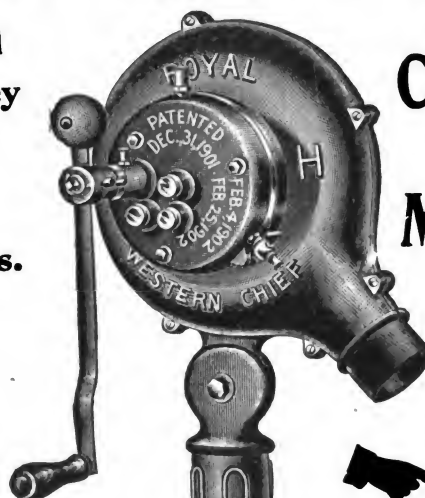
Continuous Screw Feed.  
Fast and Slow Speed.

Hand Lever Feed.  
All Gears are Cut.

Raise and Lower to Table.  
Drills to center of 24-inch circle.  
Bores 0 to  $1\frac{1}{2}$  in.  
Spindle runs up and down  $8\frac{1}{2}$  inches.  
Table runs up and down  $16\frac{1}{2}$  inches.

Both Hand  
and Pulley  
Power.

Weighs  
360 lbs.



MADE BY  
**CANEDY-  
OTTO  
MFG.CO.**

CHICAGO  
HEIGHTS  
ILL.

## The Royal Blower

is absolutely free from all spiral or worm gears, and has not a ball bearing in it. Spiral and worm gears are short lived, and ball bearings are not suited to such high speeds. Phosphor bronze is used for the lead gear and bearings; and steel for the pinions and shafts. It is the simplest, lightest running and surest worker of any Blower on this day's market.

FAN, 12 inches diameter.  
FIRE POT,  $9 \times 11\frac{1}{2} \times 4$ , inside.



Royal and  
Western Chief  
Forges, Blowers  
and Drills are  
sold by every  
First-class Dealer  
in the World.

**Ask For  
Them.**



# Our Goods for Your Cash.

## Our New Leader Sarven Wheels.

THEY HAVE NO EQUAL FOR THE MONEY.

These wheels are the best ever offered for the money. They are not high quality, like our A,B,C and D grades, and we do not warrant them as such. They are made of good forest hickory timber, thoroughly seasoned, and are put together with as much care as the better grades. They are all right for repair work, and are used by some on very cheap new work.

Prices below are for sets of four wheels with steel tire on.

### PRICE CASH WITH ORDER.

Cat. No.	Spoke	Hub	Tire	Height	Price
7c	1	6 1/2	3/4 x 1 1/4	3-3 1/2	\$5 88
8c	1 1/2	6 3/4	3/4 x 1 1/4	3-3 1/2	5 74
9c	1 1/2	6 3/4	1 x 1 1/4	3-3 1/2	5 97
10c	1 1/2	7	1 1/4 x 1 1/4	3-3 1/2	7 88
11c	1 1/2	7 1/2	1 1/4 x 1 1/4	3-3 1/2	9 00

We positively will not make these wheels in any other sizes than listed above.

We charge 25 cents extra where single wheel is ordered.

These wheels are always in stock and we will ship on same day order is received.

## High Quality Sarven Wheels.

WARRANTED.

These prices are for Set of Four Wheels without Tire.

Light Buggy, Surrey and Light Spring Wagon Sizes.

### PRICE CASH WITH ORDER.

Cat. No.	No. of Flange	Spoke	Hub	Rim	Price per Set, Without Tire				Add for Tire Put On
					A	B	C	D	
12c	01	1 1/2	6 1/2	3/4 x 1 1/4	\$3 47	\$6 66	\$5 34	\$4 38	\$1 54
13c	01	1 1/2	6 3/4	3/4 x 1 1/4	8 58	6 77	5 46	4 60	1 66
14c	01	1 1/2	6 3/4	1 x 1 1/4	8 69	6 88	5 58	4 63	1 78
15c	01	1 1/2	7	1 1/4 x 1 1/4	8 79	7 00	5 70	4 75	1 90
16c	01	1 1/2	7 1/2	1 1/4 x 1 1/4	9 81	7 56	6 19	5 38	2 61
17c	01	1 1/2	7 1/2	1 1/4 x 1 1/4	9 93	7 67	6 41	5 50	2 61
18c	01	1 1/2	7 1/2	1 1/4 x 1 1/4	11 28	9 08	7 60	6 50	2 90

The Maximum Height of Wheels, with 1 1/2 inch spoke and under, in sets, 4 feet and 4 feet 4 inches.; in pairs, 4 feet 2 inches.; for all wheels ordered in excess of the maximum height, a charge will be made of 3 per cent additional to the above list for each inch or fraction thereof, up to and including 4 feet 4 inches.

\$1.50 per set added to the list on Sarven Wheels with 1 1/2 inch spoke and under, when wheels are ordered with 18 spokes. **Single wheels 25 cents NET extra.**

The above sizes are all made with the solid flange forming Point Band on front, and Back Band on rear of hub. We will paint them in good style for \$2.00 per set; not striped unless so ordered. If color is not given, we will paint wheels black.

We will insert screws in Rims at the following prices:

Wheels, 1 1/2 Thread and under, per set	\$ .20
Wheels, 1 1/2 Thread	\$ .36

## X Grade of Sarven Wheel.

These Wheels Are Not Warranted, But Are Made From Good stock and Are Equal to the "D" Grade of Many Manufacturers.

THESE WHEELS ARE MADE IN THE FOLLOWING SIZES, AND OF ANY HEIGHT DESIRED.

GRADE X.

### PRICE, CASH WITH ORDER.

Cat. No.	Spoke	Hub	Rim	Price per Set, Without Tire	Add for Tire Put On
12c	1 1/2	6 1/2	3/4 x 1 1/4	\$4 13	3/4 x 1 1/4 \$1 54
13c	1 1/2	6 3/4	3/4 x 1 1/4	4 25	3/4 x 1 1/4 1 66
14c	1 1/2	6 3/4	1 x 1 1/4	4 38	3/4 x 1 1/4 1 78
15c	1 1/2	7	1 1/4 x 1 1/4	4 50	1 x 1 1/4 1 90
16c	1 1/2	7 1/2	1 1/4 x 1 1/4	5 25	1 1/4 x 1 1/4 2 61
17c	1 1/2	7 1/2	1 1/4 x 1 1/4	6 25	1 1/4 x 1 1/4 2 90

We charge 25c extra where single wheel is ordered.

## High Quality Sarven Wheels.

WARRANTED.

These prices are for a Set of Four Wheels without Tire

For Medium and Heavy Spring Wagons and Trucks.

### PRICE, CASH WITH ORDER.

Cat. No.	No. of Flange	Spoke	Hub	Rim	Price per Set Without Tire				Add for Tire Put On
					A	B	C	D	
25c	17	1 1/2	7 1/2	1 1/4 x 1 1/4	\$18 88	\$15 95	\$12 95	\$10 25	1 1/4 x 1 1/4 \$ 4 51
26c	21	1 1/2	8	1 1/4 x 1 1/4	19 44	16 74	14 04	10 80	1 1/4 x 1 1/4 7 56
27c	33	1 1/2	8 1/2	1 1/4 x 1 1/4	21 60	18 90	15 68	12 15	1 1/4 x 1 1/4 10 80
28c	39	1 1/2	8 1/2 to 9 1/2	1 1/4 x 1 1/4	29 64	25 94	21 57	16 67	1 1/4 x 1 1/4 12 90
29c	45	1 1/2	9 to 11	1 1/4 x 1 1/4	32 40	29 08	24 70	18 76	2 x 1 1/4 14 70
30c	49	2	10 to 11	2 x 2 1/2	37 55	32 40	28 41	22 28	2 x 1 1/4 15 90
31c	51	2 1/4	10 to 11	2 1/4 x 2 1/2	40 72	35 82	31 49	24 70	2 1/4 x 1 1/4 16 50
32c	57	2 1/4	10 to 11	2 1/4 x 2 1/2	44 46	39 52	34 58	27 79	2 1/4 x 1 1/4 16 50
33c	63	2 1/4	11 to 12	2 1/4 x 2 1/2	48 17	44 46	37 67	30 89	2 1/4 x 1 1/4 17 10
34c	71	2 1/4	11 to 13	2 1/4 x 2 1/2	51 87	48 17	40 96	33 64	2 1/4 x 1 1/4 17 10
35c	78	2 1/4	12 to 14	2 1/4 x 2 1/2	57 43	53 12	46 45		2 1/4 x 1 1/4 17 10
36c	79	2 1/4	12 to 14	2 1/4 x 2 1/2	60 52	57 43	48 17		2 1/4 x 1 1/4 17 10
37c	85	2 1/4	12 to 14	2 1/4 x 2 1/2	64 84	61 14	52 49		2 1/4 x 1 1/4 18 00
38c	95	8	12 to 16	3 x 3 1/2	69 16	65 46	56 31		3 x 3 1/2 20 40
39c	105	8 1/4	12 to 16	3 1/4 x 3 1/2	79 04	75 44			

The Maximum Height of Wheels, with 1 1/2 inch spoke and over, in sets, 4 ft. and 4 ft. 8 in.; in pairs, 4 ft. 6 in.; for all wheels ordered in excess of the maximum height, a charge will be made of 8 per cent. additional to the above list for each inch or fraction thereof, up to and including 5 ft. 2 in.

Wheels with 1 1/2 inch spoke and heavier are made with oak spokes.

For wheels ordered with width or depth of rim exceeding sizes given in list, an additional charge will be made of 2 per cent. per set for each one fourth inch or fraction thereof.

We charge 10c. extra where single wheel is ordered.

### We Will Insert Rivets in Rims at Following Prices:

Wheels with 1 1/2 tread and smaller	Per Set \$ .68
Wheels with 1 1/2 and 1 1/2 tread	Per Set .88
Wheels with 1 1/2, 1 3/4 and 2 tread	Per Set 1.00
Wheels with 2 1/2 and 2 1/2 tread	Per Set 1.25
Wheels with 2 1/2 tread	Per Set 1.50
Wheels with 2 1/2 to 8	Per Set 1.75
Wheels with 3 1/2 to 8 1/2 tread	Per Set 2.00
Wheels with 3 1/2 to 4	Per Set 2.25

**Muncie Wheel & Jobbing Co., Muncie, Ind.**

# BARCUS STOCKS

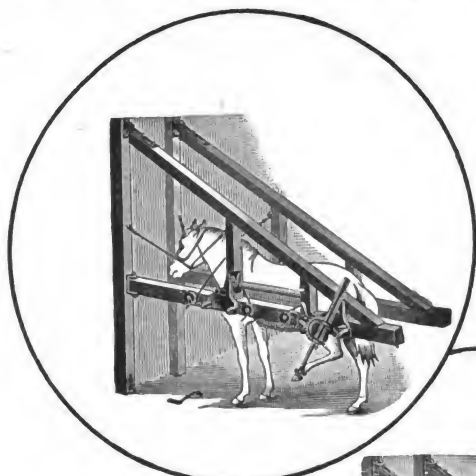
THE MOST POPULAR AND THE MOST RELIABLE SHOEING RACK ON THE MARKET TODAY. ❁ ❁

NOTED FOR THEIR SUPERIOR QUALITIES AND MANY ADVANTAGES OVER ALL OTHER SHOEING DEVICES. EVERY ONE GUARANTEED

OUR CLAIM IS

## NOT THE CHEAPEST BUT THE BEST

DON'T TAKE OUR WORD FOR IT  
READ THESE TESTIMONIALS. WE HAVE HUNDREDS MORE. WRITE TO US AND WE WILL SEND YOU A BOOK FULL OF THEM



### BARCUS Stocks

Can be quickly adjusted to any position convenient to the shoer. No ropes or pulleys to tangle or break. No bracing to floor or ceiling. Simple and easy to operate. Solid, safe, and sure to hold. No risk of being injured. . . .

Machine is complete with the hinges, ready to bolt to the stationary posts in your shop.

### The Barcus Toe Calk Machine

A MONEY MAKER AND A MONEY SAVER.

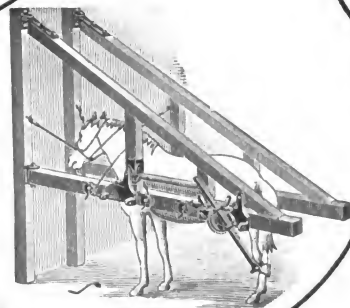
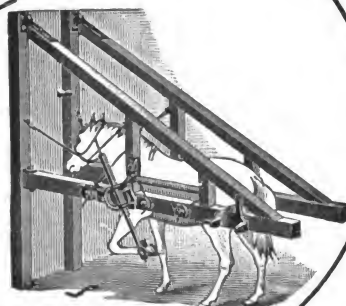
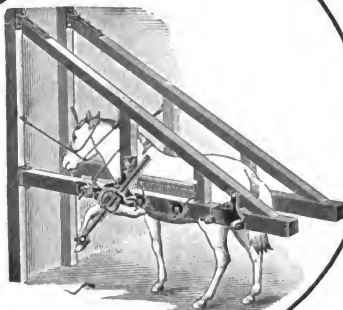
HAS A RECORD  
OF 5 Toes per Min.

WHEN IN USE THIS MACHINE WILL SAVE YOU CASH AT THE RATE OF \$6 PER DAY.

Make your own Calks from Bar Steel instead of paying high prices for Calks from the dealer. You can manufacture them yourself much cheaper. Use our new Calk Machine. Makes Calks any size or length. Write for Circulars. . .

Our complete catalogue will be sent to you free upon request. It tells all about our well known stocks and will interest you.

Write today.



ASHLAND, Ill. May 14, 1905.  
Mr. Geo. Barcus, Wabash, Ind.  
I wish to say, that the horse rack we bought of you gives perfect satisfaction in every respect.

Yours respectfully,  
Hodgins & Douglass.

ADRIAN, Mich., Sept. 28, 1904.  
Mr. Geo. Barcus, Wabash Ind.,  
Dear Sir:—I have used your Horse Stocks now for three months. Shod about 25 of the worst bronchos I ever saw with perfect success.  
Yours,  
G. F. Ball.

MINNEAPOLIS, Minn., Jun. 22, 1905  
Geo. Barcus & Co., Wabash, Ind.

Gentlemen:—In reply to your favor of the 6th would say that I cannot praise our "Barcus Horse Shoeing Rack" too highly. It is a great labor saving device and is giving entire satisfaction. I am sure if the blacksmiths throughout the country would but give the Barcus Rack a trial, your sales would be tremendous, for once having tried them, they would and could not be without a Barcus Rack. Thanking you for your attention, I am respectfully yours,  
J. YOUNG, 18 No. 2d Street,  
Minneapolis, Minn.

## GEO. BARCUS & CO., WABASH, IND. Box 61.

**RUBBER RUNABOUT, \$35.00**  
**TIED TOP BUGGY, \$27.50**  
**BUGGY TOPS, \$4.50**  
 Write for 100-page Catalogue. It's free. Compare Our Prices.  
**BUOB & SCHEU,** Estab 1883 500-520 EAST COURT ST. CINCINNATI, OHIO.



**Lathes and Drill Presses**  
 Especially for Blacksmiths and Machinists, also Hand and Power Planers and Shapers and Machinists' Supplies.  
 Catalogue M.

**SHEPARD LATHE CO., 132 W. 2d St., Cincinnati, O.**

**PATENTS PROTECT YOUR IDEAS**

No Patent, No Fee. Consultation Free. Established 1864.

**MILO B. STEVENS & CO.,**  
 852 14th St., Washington.



**Igniter Dynamos**

For all Classes of **GAS ENGINES** for make and break or jump spark systems. Our latest type price \$75. Write for circular of magnetos, etc.  
**THE CARLISLE & FINCH CO.**  
 243 E. Clifton Ave. Cincinnati, O.

**HAVE YOU TRIED**

**L AFFITTE WELDING PLATES ?**

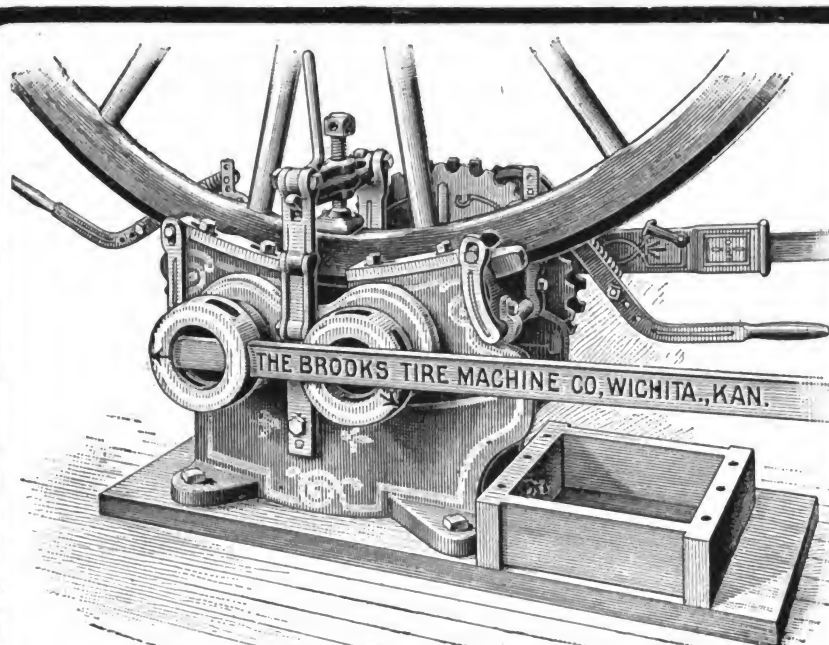
If not, send for a sample. They make difficult welds easy. Easy welds economical. Welding steel and iron at a low heat, saving one-third in time and fuel.

**SEND \$1.00** for three heavy and three light plates as a trial order. All charges prepaid.

**FOR SALE BY ALL DEALERS.**

**F. R. PHILLIPS & SONS CO.,**

Penna. Building, Philadelphia, Pa.



## A SPECIAL OFFER

we wish to make you on The Brooks Cold Tire Setter will be mailed if you will write us now. The Brooks is manufactured by the longest established and most experienced builders of edge grip cold tire setters in the United States. Remember that time and experience must precede perfection. The Brooks is the only edge grip cold tire setter indorsed by the United States Government and in use in the Government shops. Why? Because it met all the requirements and has no equal. The best is the cheapest. Manufactured in different sizes. Send us your address.

**SENT FREE FOR THE ASKING.**

A new book that every blacksmith should read. It is nicely illustrated and treats on subjects of vast importance to you. You of course want to run your shop in a way that it will make you the best possible profit and increase your business by giving the best satisfaction to your customers. We will gladly give you this book together with a pocket memorandum book with gold embossed cover containing forty pages. Send us your address now.

**THE BROOKS TIRE MACHINE CO.**

**121 N. Water St. WICHITA, KANSAS, U. S. A.**

**HAND FORGED**



**BUTCHER KNIVES**

**A GOOD SIDE-LINE**

Hundreds of blacksmiths are making large profits by selling these blades. Each one is fully warranted. Made of Sanderson Steel. Round or riveted. All sizes from 5 to 8 inch. Handles ready to put on. 1c each.

**\$ .15 EACH**  
**\$ 1.50 DOZ.**

Hand Forged Razors, ready to use, 40 cents each. Pocket Knife Handles in variety, 10 cents each. Send for sample.

**WOODWORTH KNIFE WORKS, NUNDA, NEW YORK**

**PORTER'S**  
**THE BEST**  
**BOLT CLIPPERS**

**H. K. PORTER, Sole Manufacturer**  
**EVERETT, MASS.**



"New Easy" for 5-16, 3-8, 1-2 and 5-8-inch Bolts

This Cut Shows No. 2  
**NEW EASY** for 1-2-inch Bolts  
 My Latest Tool.



## Potters Spring Brake Blocks

For Vehicles of all kinds with **STEEL OR RUBBER TIRE.**  
Have a record of excellency for seventeen years. **● ● ●**

**The MORGAN POTTER CO.**

SOLE MANUFACTURERS.

CATALOGUES.

FISKHILL ON HUDSON, N. Y.

## Morse Twist Drill <sup>A N D</sup> Machine Co. NEW BEDFORD, MASS., U. S. A.

REAMERS CHUCKS TAPER PINS TAPS SLEEVES  
CUTTERS MANDRELS SCREW PLATES DRILLS DIES SOCKETS  
FITTING COE'S BLACKSMITHS' DRILL PRESS AND PRENTICE DRILL PRESS No. 8.



Shanks .647 inch exact diameter (about  $\frac{11}{64}$  inch) and  $2\frac{1}{4}$  inches long.  
Style No. 2 always furnished unless otherwise ordered.

### WEAK BATTERIES

never bother the owner of an

### APPLE AUTOMATIC

### Battery Charger.

Easily applied to any stationary engine. It makes troubles from exhausted batteries a thing of the past, and insures a hot steady spark with plenty of speed and power at all times. Write for information.

DAYTON ELECTRICAL MFG. CO.,  
152 Beaver Bldg. Dayton, O.

Apple



## You Need Wood Working Machinery.

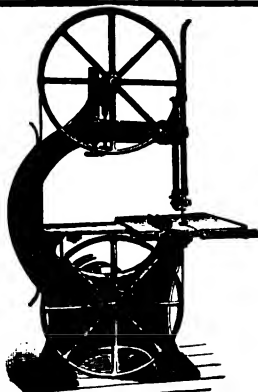
Wood Working Machines in your Shop will enable you to do better work and more of it than you can do with hand tools.

We Build Just the Machines You Need.

Catalog describing a fine line of moderate priced **BAND SAWS, SAW TABLES** and **JOINTERS** mailed for the asking.

Send for it now.

**The Crescent Machine Co.,**  
245 Main St. LEETONIA, OHIO.



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FOR  
Circularizing and Follow Up Systems

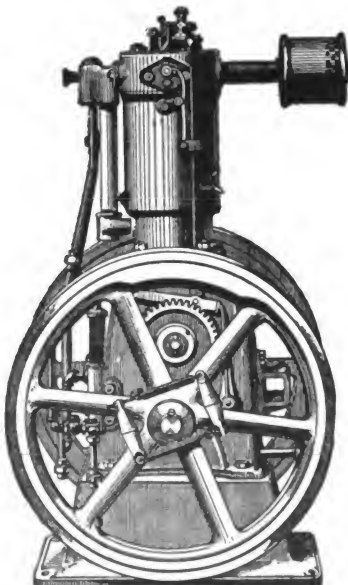
Look like the original and bring results. Furnished complete with names filled in or ribbons to match.

**LERNER - BEAN CO.,**  
363 Washington St., BUFFALO, N. Y.

## I. H. C. GAS OR GASOLINE ENGINES.

A number of meritorious features characterize I. H. C. engines, and we've put them in a booklet, which we would be glad to send you if you ask for it.

I. H. C. gasoline engines are not only safe, but also inexpensive to operate. A bright ten year old boy can handle an I. H. C. engine, because the parts are so few, simple and easily controlled that it practically runs itself.



Moreover, I. H. C. engines do not require an engineer, there is no danger of an explosion, and the operating expenses are reduced to a minimum. With a given quantity of gasoline, I. H. C. engines will generate the maximum efficiency of driving power.

I. H. C. engines are substantially constructed, have few working parts, are not liable to get out of order, and will remain serviceable for many years.

The diversity of purposes for which these engines can be used makes them available as power producers wherever an engine of the same rated capacity is required.

Made in the following styles and sizes:

Horizontal, Stationary and Portable, 6, 8, 10, 12 and 15 H. P.

Vertical, 2, 3 and 5 H. P.

Write us for illustrated catalog.

**INTERNATIONAL HARVESTER COMPANY OF AMERICA.**

(Incorporated.)

7 U. MONROE STREET, CHICAGO, U. S. A.



**Bittenbender & Co.,  
Scranton, Pa.**

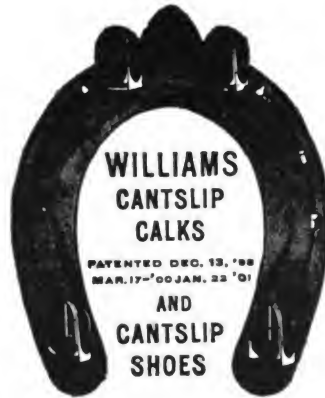
Carriage and Heavy Hardware,  
Blacksmith Supplies, Iron and Steel  
Contractors' Supplies.



A  
Cant Slip



B  
Steel Center



SOLE DISTRIBUTORS OF  
**CANT SLIP CALKS  
AND  
SHOES.**

ASK YOUR DEALER TO WRITE US FOR PRICES AND SAMPLES.



C  
Solid Steel



D  
Mud

To the Blacksmith—

Your knowledge of the requisites necessary for a removable calk for use on pavements or hard roads will convince you that our A PATTERN or original 'CANT SLIP CALK' owing to its peculiar shape, is distinctly superior to any other style of calk now manufactured. Always sharp until calk is worn out, and its great amount of wearing surface insures durability. We invite comparison with other crude IMITATIONS.

Our B pattern or hard steel center calk is a distinct improvement over all other forms of this style calk in having the HARD STEEL CENTER running entire length of calk, which being encased with a softer steel insures a perfect uniformity of shape and will wear sharper with use.

The C pattern calk is made of solid steel, and is really a perfect calk for use on snow and ice covered roads.

SOLD ONLY TO HORSE SHOERS.

Please your customers by giving them the BEST, the very reason why 'CANT SLIP CALKS' always satisfy.

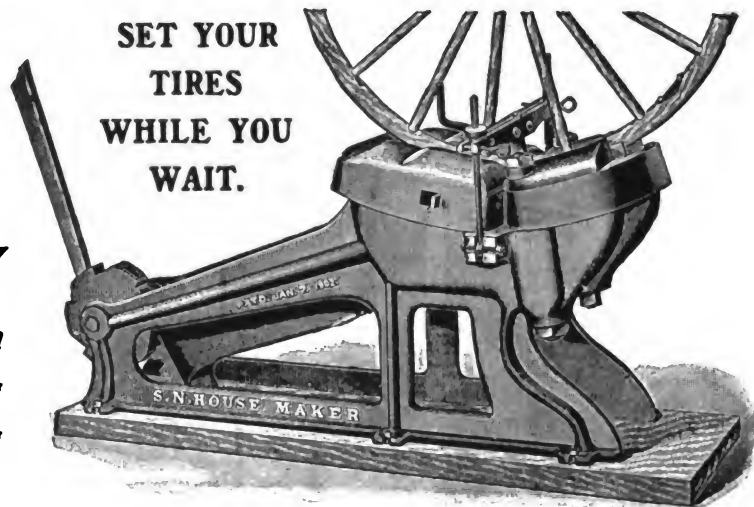
Yours very truly,

BITTENBENDER & CO.

**The House  
Cold Tire  
Setter Company**

**Takes great pleasure in  
making the following an-  
nouncements to their cus-  
tomers:**

SET YOUR  
TIRES  
WHILE YOU  
WAIT.



The First is that we are just closing another wonderfully successful year of business.

The Second is that this is the fourth year that our machines have been on the market, and one of the evidences of our wonderful success is the fact that those who have used our machines four years are our best pleased customers.

The Third is that out of the thousands of our machines in use there is not one broken up or abandoned.

The Fourth is that we have them in use in every state in the Union and in nearly all the civilized nations of the world. In fact, our success, in one respect, can be compared to that of the British Empire. The sun never sets on its possessions; neither does it ever set on our Tire Setters.

Why should we not succeed when we have such a successful machine? It does really set the tire in five minutes and does a better job than can possibly be done in the old way. Write us for catalogue and prices.

**THE HOUSE COLD TIRE SETTER CO.,**

Office and Factory, 216-220 So. Third Street,

ST. LOUIS, MO.,

And Jullus F. House, Box 323, Toronto, Canada.

# PATENTS,

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Send your business direct to Washington. Saves time and insures better service. PERSONAL ATTENTION GUARANTEED. Twenty-five years active practice. SPECIALTY: "Working on the Failures of Others".

SIGGERS & SIGGERS (Patent Lawyers) Suite 15, N. U. Bldg., WASHINGTON, D. C.

# PATENTS

Send sketch or model for free examination and report as to patentability. Patents promptly secured. Advice free; terms low; highest references, and best service. Address,

**WATSON E. COLEMAN,**

Registered Patent Attorney,

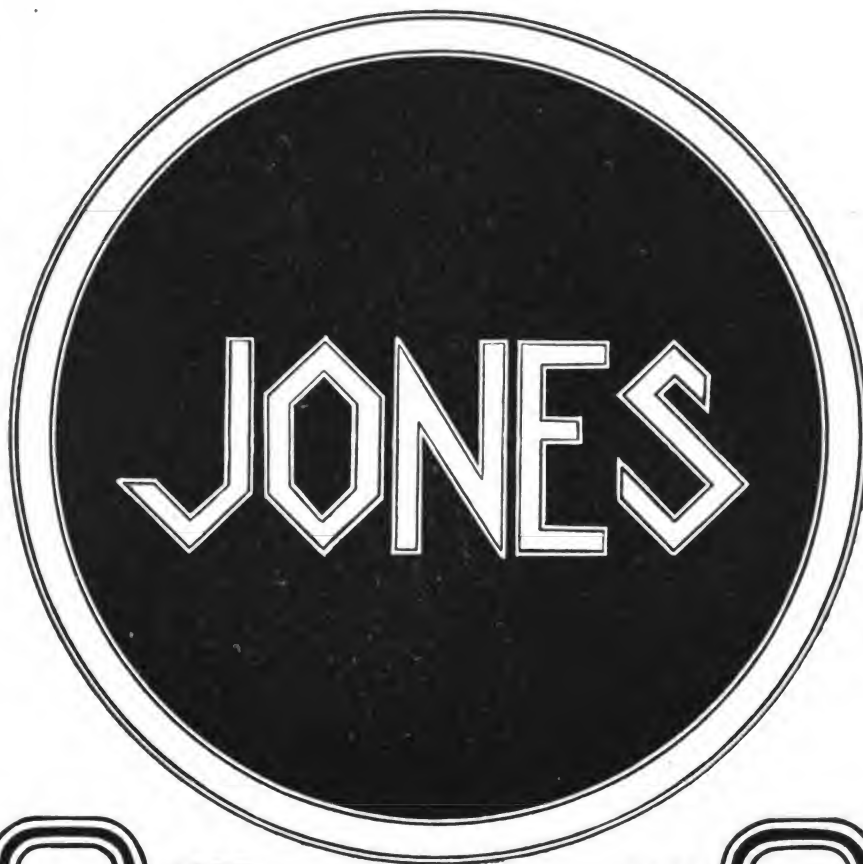
Washington, D. C.



### The Perfect Power Hammer

has no equal for simplicity and efficiency. Does a wide range of work from the lightest forging to heavy axle welding. Note the long guides, insuring a direct vertical stroke. No side motion. Easy to operate from the lightest tap to the heaviest blow. The Disk Attachment free. No other Hammer has this advantage. It only requires one Horse Power to run it. Write for prices.

Macgowan & Finigan Foundry & Machine Co.  
ST. LOUIS, MO.



1855

1905

Look for that Trade Mark on the Wheels you buy. Fifty Years of Satisfactory Service have branded . . . . .

***Jones Wheels--Best on Earth.***

ADDRESS:

**PHINEAS JONES & COMPANY,  
NEWARK, N. J.**

NEWMAN 1902 MODEL

**PORTABLE**

**WATCHMAN'S CLOCK.**



Made under the Rules and Requirements of the National Fire Protection Engineers, and Approved by all Underwriters. Simple, Accurate and Tamper Proof. In Service in Almost Every Large Plant and Institution. Gives Satisfaction Everywhere. Let us send you interesting circulars giving detailed description of all working parts. Write to-day for Circular B.

**NEWMAN CLOCK CO.,**

710 Masonic Temple.

CHICAGO, ILL.

# If You Had A Helper

and you **knew** that a good share of your trade was **gotten** and **held** through his influence, and that when he left, the trade would leave,

## Would You Keep Him?

There are scores of blacksmiths who know that **Morgan & Wright Hoof Pads** help them to hold their pad business because of the satisfaction they give to horseowners.

## Do YOU know this?

These are "the pads that help to build up the pad business"

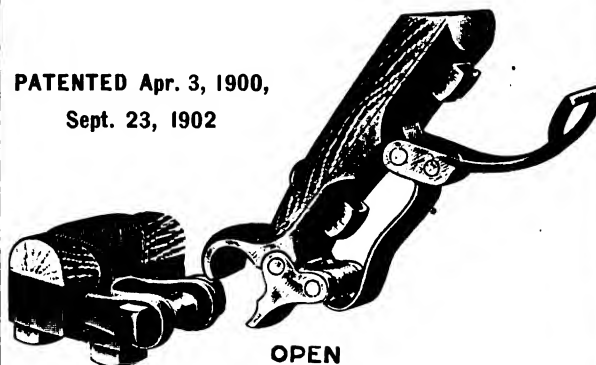
**MORGAN & WRIGHT PADS**  
**ARE GOOD PADS**

**MORGAN & WRIGHT,**  
**Chicago,**

New York, Dayton, Detroit, Atlanta,  
St. Louis, San Francisco.

# THE HOLD FAST COUPLER

PATENTED Apr. 3, 1900,  
Sept. 23, 1902



All Steel All Right All the Time

Fits any bolt or lug from  $\frac{7}{16}$  to  $\frac{3}{4}$  inches in diameter. No Bushings of any kind required. Takes up its own wear. One hand, the only tool required to operate it. Quick as a Wink. Silent as the Grave. Drop forged from bar STEEL. Crucible STEEL Spring, every one right. Workmanship the BEST. Nothing cheap about it but the Price. STEEL'S the stuff, no Malleable Iron in the Holdfast. Made "a little better than seems necessary." We can furnish the Holdfast with Weldless long length shaft irons 28 to 34 inches long, and with 8-inch "T" pieces for cross-bar. Irons are  $\frac{5}{16}$  by  $1\frac{1}{8}$  inches in cross section, with quarter round edge. The Holdfast has the well-known BRADLEY quality, the ALL RIGHT brand. If you are interested, write for prices or order a sample pair.

**C. C. Bradley & Son**  
SYRACUSE, NEW YORK

**To SAVE TIME is to SAVE MONEY**

**THE SUPERIOR**

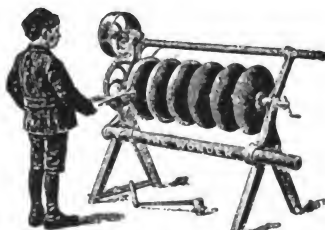


**MINED ONLY BY**

**LILLY COAL CO. Altoona, Pa.**

**SAVES TIME  
DOES GOOD WORK QUICKLY.**

## THE WONDER DISC SHARPENERS



THE LITTLE WONDER.

BUY

### THE WONDER DISC SHARPENERS

Why spend your money for an old, out-of-date machine, when you can buy the latest, simplest, neatest, and Best Constructed Machines on the market at the same price?

**WHY BUY THE WONDER? BECAUSE THE WONDERS** are the only machines adjustable to all conditions.

Can shear any part of edge to any bevel. Can shear back from edge as far as required.

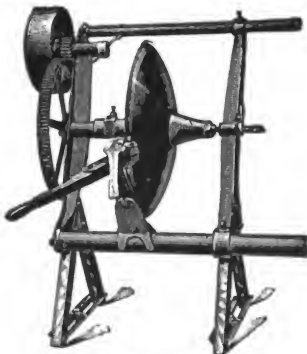
Can use tool on either side of disc.

Can shift from one disc to another.

Can do all this without the turn of a set screw or nut; is a positive feed; automatically adjusts itself to wobbling or bent discs; knives made of best grade, self-tempering steel, will last a life time for hand and power.

**FULLY WARRANTED.** We pay the freight both ways if not as represented.

The LITTLE WONDER will sharpen any size disc up to 22 inches in diameter. The accompanying cut shows the LITTLE WONDER at work on a whole section of discs. This machine is especially adapted for sharpening Disc Harrows and rolling Coulters.



THE GIANT WONDER.

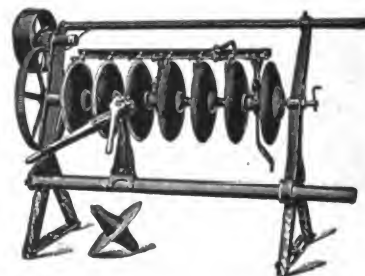
The above cut shows the GIANT WONDER at work on Disc Plows. Will sharpen any size from twelve to thirty-two inches in diameter.

*Write to us direct if your dealer cannot supply you giving us his name and address. Send for circulars. Manufactured by*

**A. E. DURNER, Evansville, Wis.**

*For Sale by Leading Dealers in U. S. and Canada.*

The GIANT WONDER is a larger and heavier machine; has holder attachments for rolling coulters and disc plows; will take in discs up to 32 inches in diameter; is a geared machine and will also take in disc harrow sections same as the Little Wonder and do the work equally as well. The only machine on the market with these advantages.



The above cut shows the GIANT WONDER at work on a Seven Disc section without removing Discs thereby saving one-half the time and labor as in many cases you could sharpen a whole section of Discs while your competitor is taking his off the shaft, the old-fashioned way.

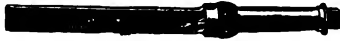
**ASK YOUR DEALER FOR PRICES.**



# HAYSLER IRON COMPANY

## KANSAS CITY, MISSOURI.

### No. 12 Half Patent Axles-Short Bed.



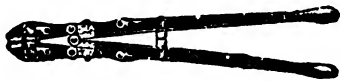
#### STEEL-DOUBLE COLLAR

5-8 x 6 in. Per set.	\$1 13	11-8 x 7 in. Per set.	\$1 44
7-8 x 6 " "	1 13	11-4 x 6 1/2 " "	1 75
15-16 x 6 " "	1 30	11-4 x 7 " "	1 75
15-16 1/2 x 6 1/2 " "	1 30	13-8 x 7 " "	2 75
1 x 6 " "	1 25	13-8 x 7 1/2 " "	2 75
11-16 x 6 1/2 " "	1 40	11-2 x 7 " "	3 60
11-16 x 7 " "	1 40	11-2 x 8 " "	3 60
11-8 x 6 1/2 " "	1 44		



No. 2510. Hayler's Iron Co's Horse Rasp. Order a sample, give it a trial and see if it is not just as good or better than those for which you must pay more.

	12 in.	14 in.	16 in.
Price . . . . .	25c	30c	42c



No. T 3340. Our Easy Bolt Clippers have all the latest improvements such as patent adjustment, locking device, rubber buffers, etc. They are made of the best material throughout. Jaws are high grade steel. Every clipper fully tested. Don't use small clippers on large work, you may break them; or large ones on small work, they are heavy and cost more.

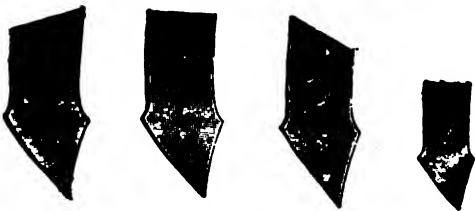
No. 0, for cutting bolts 5-16 in. or less, weight 3 pounds. Price \$1.88

No. 1, for cutting bolts 3/4 inch or less, weight 4 1/2 pounds. Price \$2.08

No. 2, for cutting bolts 1/2 inch or less, weight 7 1/2 pounds. Price \$2.88

No. 3, for cutting bolts 5-8 inch or less, weight 12 1/2 pounds. Price \$4.60

#### Steel Cultivator Blanks.



Drawn, shaped and polished, no holes. Made of Genuine Crucible Cast Steel with extra heavy upset points.

3 1/2 inch wide, each . . . . . 15c

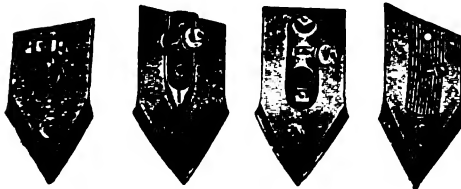
5 inch wide, each . . . . . 18 1/2c

3 1/2 inch blanks are right and left crook.

5 inch blanks are straight, right and left crook.

#### Complete Cultivator Blades.

3 1/2 and 5 inch Straight, and Right and Left.



With No. 410

Back on.

Takes Round

standard

1 to 1 1/2 in.

diameter.

With No. U

Back on.

Applies to

any Slotted

Standard with

Convex Front.

With No. 5

Back on.

Applies to

any Slotted

Standard with

Concave Front.

With Special

Back for

Wood

Standard.

Complete as shown, with backs and bolts ready to use. These shovels have extra heavy points and are full polished, made in both Crucible Cast Steel and Soft Center Steel. Always specify which style back is wanted.

#### PRICES

Crucible Steel:			
3 1/2 in., 6 to set, per set	-	-	\$1 65
5 in., 4 to set, per set	-	-	\$1 50
Soft Center Steel:			
3 1/2 in., 6 to set, per set	-	-	\$2 50
5 in., 4 to set, per set	-	-	\$2 25

### Power's Pattern Fire Pot.

No. T 1240. This fire pot can be used on most of our tuyere irons. It prevents the fire from spreading and produces a compact, bright heat. It reduces the quantity of coal required and protects the tuyere iron. Weight about 2 1/2 lbs. Each - 75c.



#### Blank

#### Plow

#### Lays.

12-inch, Solid Cast.	Price, each	-	\$0.45
14-inch, Solid Cast.	Price, each	-	.55
16-inch, Solid Cast.	Price, each	-	.65
12-inch, Crucible Cast.	Price, each	-	.53
14-inch, Crucible Cast.	Price, each	-	.65
16-inch, Crucible Cast.	Price, each	-	.75
12-inch, Soft Center.	Price, each	-	1.20
14-inch, Soft Center.	Price, each	-	1.35
16-inch, Soft Center.	Price, each	-	1.50

The above shares are very heavily upset on land-side edge.



### Haysler Blank Lister Shares.

#### NEW PATTERNS PERFECT SHAPES

Crucible Steel, 14 inches. Each . . . \$0.75

Soft Center Steel 14 inches. Each . . . 1.75

Filled and Balled Lister Lays, finished ready to bolt on, for any Lister in the market.

14 inch Crucible Steel. Each . . . \$0.95

14 inch Soft Center Steel. Each . . . 2.25

### Some of Our Prices

Every article we sell is sold on the same small margin of profit as shown by these prices. Our big No. 61 Catalogue contains 148 pages of bargains of interest to every blacksmith, wagon maker and machinist. This catalogue will be sent you absolutely free. We want every blacksmith in the west to have one.

#### WRITE FOR IT TO-DAY

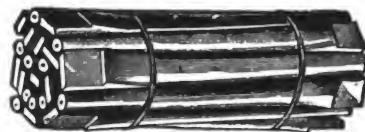
We do only a mail order business. We have no drummers, we do not lose any money on account of bad debts and when you buy from us you don't help pay some one else's bills.

Our No. 61 catalogue is the most complete blacksmiths' supply book ever published and it's free for the asking. Write for it to-day.

### Mower Sickles.



We carry every kind of implement repairs and supplies. Our catalogue gives dealers' prices. Write for our book to-day.



Spokes of every kind at much lower prices than you are now paying.

No. T 970. It is the only Tire Shrinker that can be operated successfully by one man. The operation of bringing down the lever grasps the tire and does the work; raising the lever opens it. By this means it is not necessary to remove the tire until it is upset as much as required. It is especially made for heavy wagon and truck tires. It is very powerful, having a long lever.



#### MOLES

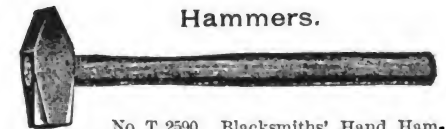
Size in Stock	Net Price, Each	
No. 1, for 2-inch tire, each	-	\$5.12
No. 2, for 3-inch tire, each	-	6.00
No. 3, for 4-inch tire, each	-	9.00

### No. 11 Half Patent Axle-Square Beds.



#### STEEL-DOUBLE COLLAR

3 1/2 x 6 1/2 in. Per set	\$1 38	11-16 x 6 1/2 in.	\$1 75
5 x 6 1/2 " "	1 38	1 1/4 x 6 1/2 " "	1 75
15-16 x 6 1/2 " "	1 38	1 1/4 x 7 " "	1 75
1 x 6 1/2 " "	1 50	1 1/4 x 7 " "	2 18



#### Hammers.

No. T 2500. Blacksmiths' Hand Hammer, extra fine steel; fully warranted; handle not included in weight.

No. . . . . 1	2 lb.	3 lb.	3 1/2 lb.	5 lb.
Weight - 2 lb.	2 1/2 lb.	3 lb.	3 1/2 lb.	4 1/2 lb.
Price - 47c	50c	54c	59c	85c

Our line is the most complete and our prices the lowest in the United States.

### Bent Hickory Rims

Width.				
1/4 in., 1 in. deep; per set	-	-	-	\$0.80
1 in., 1 1/4 in. deep; per set	-	-	-	.85
1 1/4 in., 1 1/2 in. deep; per set	-	-	-	.90
1 1/2 in., 1 3/4 in. deep; per set	-	-	-	1.00
1 3/4 in., 1 3/4 in. deep; per set	-	-	-	1.20
1 3/4 in., 1 3/4 in. deep; per set	-	-	-	1.40
1 3/4 in., 1 3/4 in. deep; per set	-	-	-	1.60



### Dry Finished Oak Felloes.

Size 1 1/4 in., tread 2 1/4 in. deep, regular height 3 ft. 8 in. and 4 ft. 6 in.; per set . . . \$1.60

#### ROUGH SAWED FELLOES

1 1/4 x 2 1/4, any height, per set . . . \$1.20

### Tire Bolts.

1 1/2 x 8-16, per 1000	-	-	-	\$1.35
1 1/2 x 8-16, per 1000	-	-	-	\$1.46
2 x 8-16, per 1000	-	-	-	\$1.58



### Emery Wheels.

Best in the market. All sizes in stock. 2 x 12, each \$3.15.

2 x 14, each \$4.38

1 1/2 x 12 " \$2.41

1 1/2 x 14 " \$3.39

### Finished Oak Tongues.

Finely finished, straight and clear, sizes 3 x 3, 3 1/4 x 3 1/4, 3 1/2 x 3 1/2, 3 3/4 x 3 3/4, each . . . \$1.00



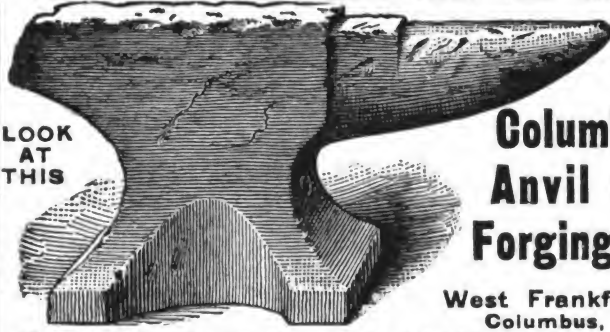
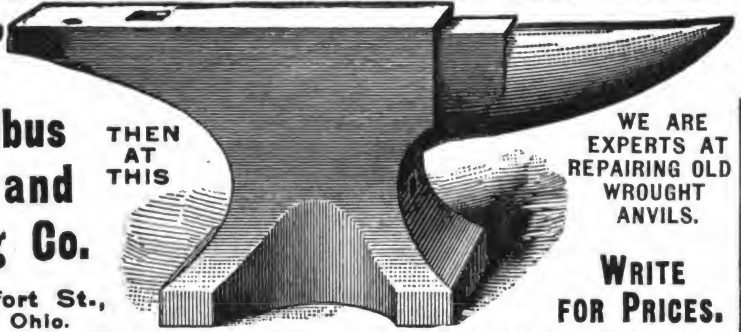
Suitable for saw gumming and light work of all kinds. Has long bearings and is a first-class tool in every way. Spindle 1 x 1 1/8 in. Diameter of spindle between flanges, 3/4 inches. Bearings, 4 inches. Pulley, 2 x 2 1/4 inches. Diameter of flanges, 3 inches. Distance between wheels, 12 inches. Weight 40 lbs. Price \$4.95. Carries two wheels, 12 x 1 1/4 inches.



### Buggy Tops, Cushions, and Trimming Goods

of every kind.

NO MATTER HOW BADLY THEY ARE BROKEN WE CAN REPAIR THEM IN GOOD SHAPE.

LOOK  
AT  
THISColumbus  
Anvil and  
Forging Co.West Frankfort St.,  
Columbus, Ohio.THEN  
AT  
THISWE ARE  
EXPERTS AT  
REPAIRING OLD  
WROUGHT  
ANVILS.WRITE  
FOR PRICES.

WE ALSO MANUFACTURE THE CELEBRATED ARM AND HAMMER BRAND ANVIL.

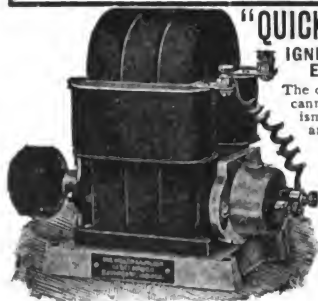
ASK YOUR DEALER FOR THEM.

**HONEST DEALINGS**

Before an advertisement is accepted for this journal, careful inquiry is made concerning the standing of the house signing it. Our readers are our friends and their interest will be protected. As a constant example of our good faith in AMERICAN BLACKSMITH advertisers, we will make good to subscribers loss sustained from any who prove to be deliberate swindlers. We must be notified within a month of the transaction giving rise to complaint. This does not mean that we will concern ourselves with the settlement of petty misunderstandings between subscribers and advertisers, nor will we be responsible for losses of honorable bankrupts.

SHORT  
BUCCY  
BOWS

S. N. BROWN &amp; CO., DAYTON, O.

**"QUICK ACTION"**IGNITING DYNAMOS  
Excel All Others!

The only generator that cannot lose its magnetism. For either make and break, or jump spark work. Also spark coils. Send for Catalogue B.

The  
Knoblock-  
Heideman  
Mfg. Co.,  
SOUTH BEND,  
IND.

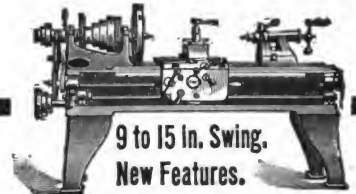
**Locations  
for Industries***Erie Railroad System  
New York to Chicago*

The Erie Railroad System's Industrial Department has all the territory traversed by the railroad districted in relation to resources; markets and advantages for manufacturing, and can advise with manufacturers of specific products as to suitable locations, furnishing them with current information of a comprehensive nature, dealing with the project in its full relation to manufacture and commerce.

Address

LUIS JACKSON

Industrial Commissioner, Erie Railroad Company  
21 Cortlandt Street, New York.

9 to 15 in. Swing.  
New Features.SEBASTIAN LATHES are Good Lathes  
Catalogue Free. Sizes 9, 10, 12, 15 Inches.

Our engine lathes are provided with both screw and rod feeds as well as power cross feed. Gears to cut all standard threads from 5 to 36 are furnished. Steady and follower rests, large and small face plates and countershaft go with each Lathe. Foot Lathes, Tools and Supplies.

SEBASTIAN LATHE CO.  
124-126 Culvert Street, CINCINNATI, OHIO.



The Ideal Steel Toe Calk  
Write for Circular and Prices.

THE WEYBURN COMPANY  
Rockford, Illinois.



Style No. 0,  
Cyclone  
Portable  
Forge.

Easy  
Running.  
Powerful.  
Large  
Capacity.

Our Free  
Catalogue  
illustrates  
more  
than 20  
other styles

**CYCLONE  
PORTABLE  
FORGE**

The Cyclone Portable Forge, shown here, is a favorite everywhere. Suitable for heavy, as well as light work. Has a 28x40 in. hearth, large capacity coal box and a 14 in. fan. The deep firebox and powerful blast make the Cyclone Style No. 0 capable of doing the heaviest kind of work. The Cyclone has double Ratchet, Adjustable Legs, Solid Frame, Detachable Lever hung on Ball Joint and swinging in chilled seat. FULLY GUARANTEED.

Write today for our FREE Catalogue and SPECIAL INTRODUCTORY PRICES.

FOOS MANUFACTURING CO.,  
28 Sheridan Ave. SPRINGFIELD, OHIO.

**TOOLS  
FOR THE  
HORSESHOER  
AND  
BLACKSMITH  
IS OUR SPECIALTY**

New Rounding Hammer.

FREE—a catalogue and hanger giving a table which will enable you to cut horseshoe moulds to any weight without waste.

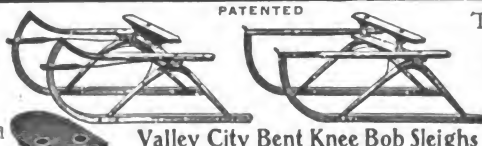
**Champion Tool Co.**

Meadville, Pa.

THE JOSEPH F. MCCOY COMPANY, 157 Chambers St.,  
New York City. Eastern Selling Agents.

**Success  
Oscillating  
Sleigh  
Knees.**

For farm, road and  
lumbering Bobs.  
Sizes, 1 1/2, 1 3/4, 2, 2 1/4,  
3, x 3 1/2 in. runners.  
Satisfaction Sure.  
Try sample set.



Valley City Bent Knee Bob Sleighs

For Pleasure, Delivery,  
Express, Sleigh, etc.

The Strongest,  
Neatest,  
and Best.

THIS is the Brown Os-  
cillating Sleigh Knee.Needs No Recommendation.  
Satisfaction Guaranteed.

Sizes, 1 1/4, 1 1/2, 1 3/4,  
2, 2 1/2, 3 and  
3 1/2.

Write for  
circular and  
prices on our  
complete  
line of  
sleigh goods.

Sherwood Hall Co., Ltd., 24-28 IONIA ST., GRAND RAPIDS, MICH.

# Buffalo Blacksmith Tools.

## Buffalo Down Draft Portable Forge.

EVERY BLACKSMITH WILL APPRECIATE THE VALUE OF THIS INVENTION.

(PATENTED 1905.)

THIS MACHINE  
IS FULLY  
PROTECTED  
BY  
PATENTS.

A clever combination of mechanical and natural draft is the working principle of this new forge.

The dense clouds of smoke which pour into the smithy from the ordinary forge when

starting up are entirely done away with in this machine fitted with a Buffalo No. 200 Blower—No smoke, gas or soot.



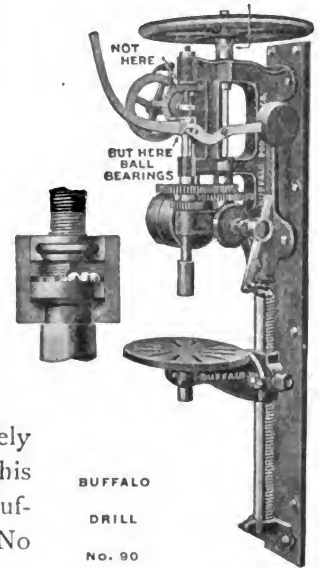
BUFFALO  
DRILL  
NO. 66

BUFFALO BALL-BEARING DRILL  
NO. 66.

This drill has our patent spindle head ball bearings, the same as No. 90 drill. It is a smaller machine, but just as carefully built, and will be found the right size for the average smithy. Drills to center of 15-inch circle,



Buffalo Down Draft Portable Forge No. 666 with Heavy steel plate hearth.  
No. 660 same in all respects except it has cast iron hearth.



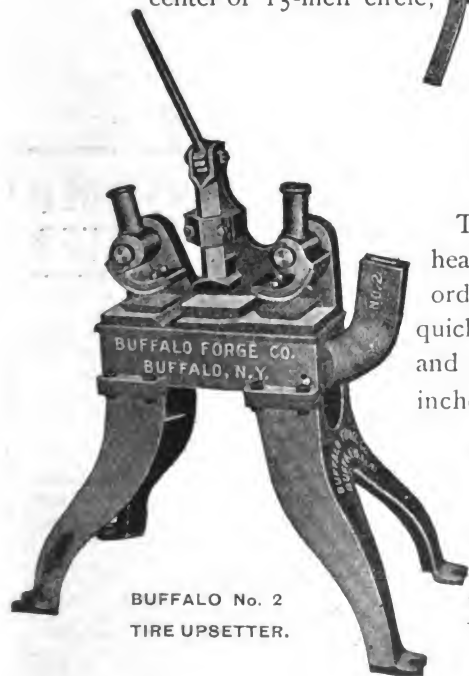
BUFFALO  
DRILL  
NO. 90

BUFFALO BALL-BEARING DRILL  
NO. 90.

The proper use of ball-bearings in this drill reduces frictional wear to a minimum and makes it the easiest running drill in the world. No brass thrust bearings or babbit linings to wear out. All shafts run in bearings bored and drilled in solid stock. Drills to center of 22-inch circle.

### Buffalo Tire Upsetter No. 2.

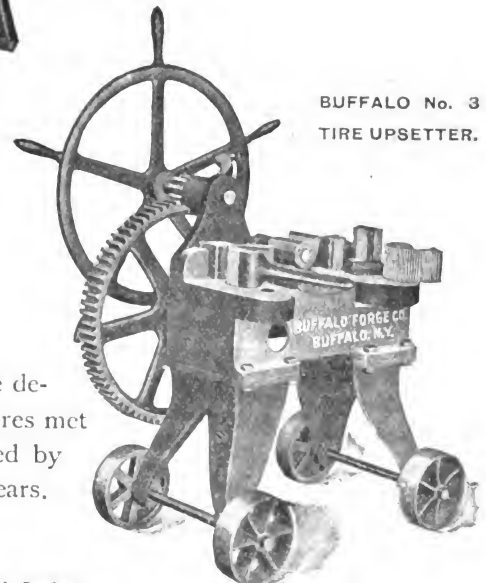
This machine will handle the heaviest work encountered in the ordinary smithy. The handiest and quickest machine in use. Strong and compact. Upsets tires  $3\frac{1}{2} \times \frac{5}{8}$  inches.



BUFFALO No. 2  
TIRE UPSETTER.

### Buffalo Tire Upsetter No. 3.

This is a high power machine designed to handle the heaviest tires met with in ordinary service. Operated by windlass through reduction gears. Upsets tires  $6\frac{1}{2}$  inches wide.



BUFFALO No. 3  
TIRE UPSETTER.

Canadian Friends: Save Duty, Buy of  
The Canadian Buffalo Forge Company, Ltd., Montreal, Quebec.

# BUFFALO FORGE COMPANY, BUFFALO, N. Y.



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23

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Milford, Texas,  
Nov. 11, 1905

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(Signed) LEM. T. WRAY,  
Notary Public.  
JNO. BLACKWELL,  
Blacksmith.

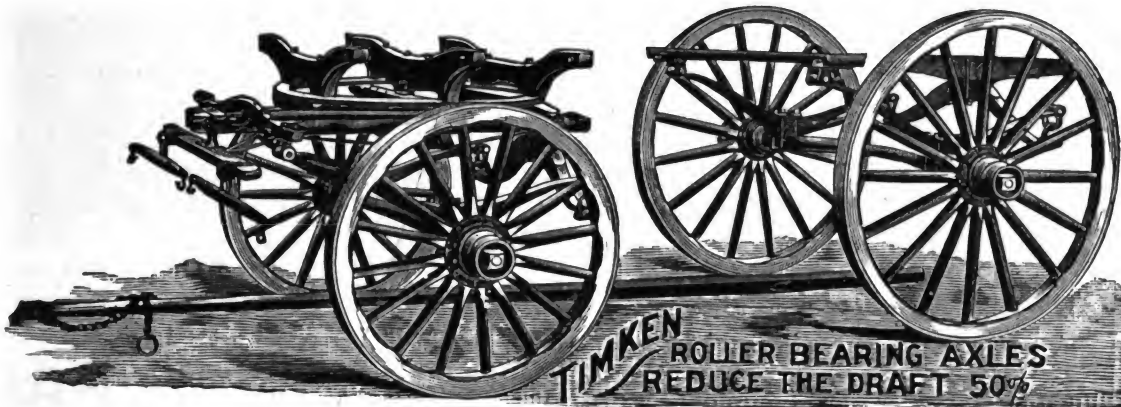




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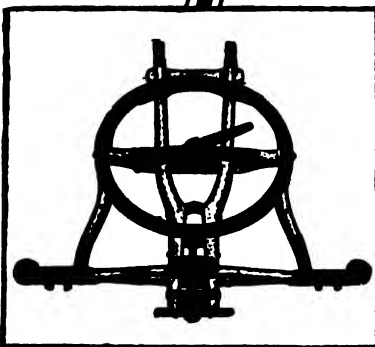
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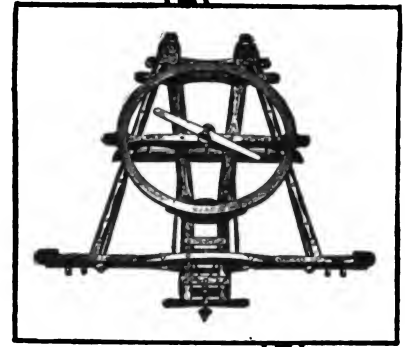
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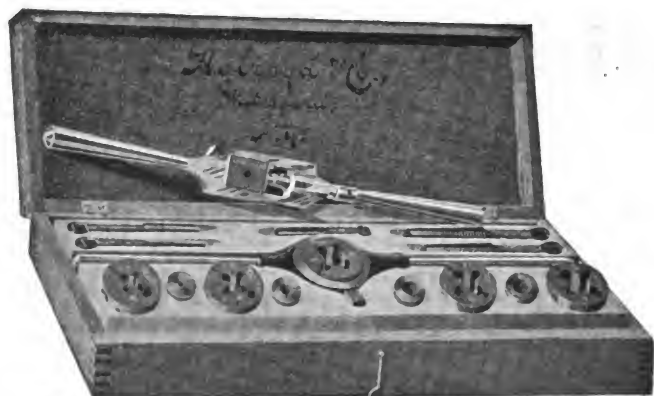
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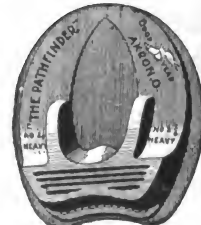
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EASY.



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## When Purchasing a Smith Shop

That man would certainly be considered as lacking in good business sense who would purchase a prosperous smithing business without insisting upon a written agreement from the seller not to open a smithshop within a distance sufficient to affect the business purchased. And yet a case of this kind was brought to our notice but a short time ago. The result of the purchaser's failure to exact an agreement from the seller was that within six months after the business changed hands, the seller started a business of exactly the same nature within a block of his former business place. It is almost needless to say that he here regained most of the trade that formerly had been his and that the purchaser of the original business is now looking for a new location. Of course this would have been prevented by a simple agreement upon the matter when the business was sold, but, as further investigation proved, the buyer did not think the seller "would do anything as mean as that." This is usually the case, and the purchaser often takes too many of the seller's good qualities for granted. When a business changes hands it is far better to have an agreement in black and white

covering every contingency, than to regret your failure to do so when it is too late. There is too much at stake to allow sentiment or personal feelings to intervene. In such cases remember always that business is business.

## A Good Start for 1906 Smith Shop Advertising.

A smith without a sign before his door misses business that would otherwise walk into his shop. A sign tells people who you are and what you do. The nearer it is to the people and the oftener they see it, the better they become acquainted with you. And if you can place your sign where the man you want as a customer will see it, not when he happens to pass your shop, but when he is in his own home or place of business, it will be better than a whole shop front of signs.

A calendar bearing ones business card does all this and more, and therein lies its advertising value. The prospective customer to whom you present it is reminded of you every day—each time he looks at his calendar. It shows that you are progressive and that you want business. And a man is more likely to bring his horses and wagons to you when he knows you want his trade. So if you intend to make a bid for more business in 1906, a splendid scheme is to mail or hand a neat, attractive calendar with your advertisement on it at New Year's to the men whose trade you seek to secure or retain.

Our calendar for this season is more appropriate and distinctive than any of our previous ones. Orders are coming in at a rate that bids fair to exhaust the edition at an early date. Hence those who wish a supply and have not yet made their wants known, would do well to communicate with our calendar department immediately. Full particulars regarding these calendars, with prices and other information may be found on page 38 of this issue.

## Proper Arrangement of Machines in the Modern Shop.

This question does not always receive the consideration it merits. The major-

ity of smiths little realize its importance when fitting out their shops; especially the wood-working departments. The majority of shop-plans received by us show that while some regard is paid to economical arrangement, not enough attention is given to this important factor in the economical handling of smith-shop work. With the possible exception of a full equipment of modern tools, there is nothing that appeals so strongly to the modern smith as machines arranged in such a manner as to bring all unnecessary steps and handling down to a minimum. And a shop arranged in such a manner will save time, which though perhaps no great factor in the slack season, may mean dollars in the rush months.

It is almost impossible to lay down rules that can be rigidly adhered to in each case. There are many things, such as the dimensions of the shop; the location of wings; number of machines and the general character of the work, which must be considered. A few suggestions of a general character, however, will not come amiss here and may point out cases of misarrangement in the individual shop. It is unnecessary to say that all machines in which heated metal is worked should be as near the fires as possible. Machines which usually work together, that is, those generally used in a regular order on certain work, should be located as close together as convenience in working will permit. The best place for the shear is near the stock rack. Those tools which are used at several different times on one job should be centrally located. The above illustrations are sufficient to suggest to the smith who is laying out his shop, that the power-hammer should be near the forge, and the rip saw should not be at one end of the shop while the planer is at the other.

Then again there must be a certain amount of space left for new machines, if the smith intends to expand his business. These new machines must also be placed in such positions as to be most convenient and while no exact spaces can be allowed for machines not yet

purchased, a fair idea of the lines along which the business is likely to expand is sufficient for intelligent figuring.

### The Smelting of Iron Ore by Electricity.

Doctor P. I. T. Heroult, technical director of the French Electro-Metallurgical Society and perhaps the best living authority on the smelting of iron ore, has invented a process of smelting iron ores and manufacturing steel by electricity. Two great plants for the

the extreme west of Canada fuel does not cost much, but in the interior the price is prohibitive. This is especially true of Ontario and Quebec, where there are immense deposits of magnetite. These ore bodies have long remained undeveloped because they could not be economically treated. But in their vicinity is waterpower in abundance, and that means cheap fuel. Doctor Heroult has smelted magnetite by electricity, and it is a success. He is reasonably sure we can produce pig iron and a high-grade steel here. But to

sembled without any apparent regard for harmonious effect whatever. Such pieces, however, are happily the exception and not the rule. Usually the work shows much thought and care both in choosing the designs and in working them out. Two examples of this latter class are shown on our pages this month. These were forged at the Illinois State Reformatory under the direction of Mr. Thomas Googerty. The poker, tongs, shovel and stand are simple in design, yet they are very artistic and with andirons to



A PARTICULARLY PLEASING SCROLL IN WROUGHT IRON.

refining of steel by the Heroult process are now in the course of construction, one in Germany and the other at Syracuse N. Y. The latter is being erected by the Holcomb Steel Company, and the cost of the works will be—\$1,000,000, and the output will be from 80 to 100 tons daily. The company propose to manufacture tool steel and also high-class billets. The Holcomb Company will be the first concern on the American continent to use electricity in connection with the making of steel. It will be produced by the ordinary method, and the electricity will be applied to a purifying or refining process. The great metallurgical expert will not give all his time to the Syracuse enterprise. He has undertaken to superintend experiments in the making of pig iron and steel at a plant which is now in course of construction at Sault Ste. Marie.

In Europe and in the United States, where fuel is cheap, the ordinary processes can be utilized for refining. In

make certain beyond all peradventure, and to ascertain all the facts that can be learned in connection with electric smelting, experiments for six months will be conducted at the "Soo" in a plant of special design and construction. Doctor Heroult thinks that under favorable conditions pig iron can be made for \$10 per ton, while steel will cost only about \$4 per ton more to produce. This means a saving of several dollars as compared with the cost of producing pig iron and steel elsewhere. But even if the cost were the same it would mean a great thing for Canada.

### Artistic Examples of Wrought Iron Work.

The craftsman who wishes to exemplify the artistic and beautiful in wrought iron, must needs have a knowledge of artistic effect as well as be reasonably expert in the handling of metals and tools. We occasionally find pieces of wrought iron work that have been as-

match would make a most pleasing addition to the artistic effect of a drawing room. The ornamental piece shown in the other engraving is a most artistic scroll and shows not only an intimate knowledge of the smithing art but an understanding of composition and harmony as well.

### Does Gas Engine Power Pay.

W. B. N.

It pays in many ways, as for instance gas engines, take up little room, require but little attention, and are always there when wanted. The cost of gas is nothing compared with coal and steam. When you have a gas engine you save money, because if you haven't work to keep it running all day, you can turn it off and the expense is off too. You will not have to wait till the steam is up as with a steam engine, but you can commence at once. We have tried both steam and gas but we find the latter is by far the best, because we are in a small country town where we cannot keep it



running all day long. Therefore when customers come for sawing, all we have to do is turn on the gas. But with steam we have to wait 3 or 4 hours before we could start, and time is money.

We have a 4 H. P. gas engine and do wheelwrighting and blacksmithing, shoeing and general smithing. With our engine we run a sawing machine, a boring machine, a band saw, a lathe, a tenoning machine, a blower for smith fires, a drilling machine, an emery wheel, a coke mill, a grindstone and a jack planer. Of course the engine will not work all these at once, but it will work two or three machines, which is all we require at one time.

You can put the gas engine where you like, in a corner, outside, or under the shop floor. For instance, our gas engine stood on the ground floor, and was taking up the room where we wanted to put the jack planer so we made a cellar and placed the gas engine in it. Here we find it works better than ever. The shafting is all under ground and therefore we have no overhead belts. This is also better for the machinery, as the belt keeps them down. This may be a useful hint to brother smiths who have purchased no gas engine on account of lack of room.

Gas engines do not require a lot of repairs. They are so simple a child can work them. Many smiths think, "I would have a gas engine but I know nothing about them; if any thing went wrong what should I do."

But they are so simple you could soon put it all right again. When an engine is sent out instructions are sent as well. A gas engine will do the work of twenty men and requires no pay. With these few remarks I advise all brother smiths who have not power to get it without delay and it will soon pay for itself, for delay is the thief of time.

### Surfacing Methods.

Facts and Formulas Connected  
Therewith.

M. A. HILLICK.

Former issues of the AMERICAN BLACKSMITH have dealt explicitly, and we may say, exhaustively, with the details of mixing, applying, and surfacing what may be called the primary foundation coats, and we purpose therefore to confine our attention in this article to the surfacing of the roughstuff and the application and surfacing of varnish. Very properly much emphasis has been laid upon the importance of the earlier surfacing processes—the application of the primer and lead coats, the surfacing practices applied to same, the applica-

tion of roughstuff, puttying etc—and the result has been that the necessity for the highest skill and painstaking care in this work has become a watchword in all modernly conducted paint shops, big or little, influential or otherwise.

#### Surfacing Roughstuff.

Granting the roughstuff to have been properly applied and to sufficient depth to afford a good rubbing foundation, this being of the first importance upon old or new work, we come to the work



A DESIGN BOTH PLEASING AND SIMPLE.

of surfacing this body of roughstuff—of reducing it to a uniform level and to circumspect smoothness. In rubbing roughstuff some painters, notably in small shops, esteem a guide or stain coat, as it is variously called, invaluable, but we advise our friends in the small shops to learn to rub roughstuff without the aid of the guide or stain coat. It puts the responsibility for knowing when the surface is rubbed enough directly upon the workman, makes him more careful, and develops his surfacing ability.

The roughstuff rubber's equipment should consist of the following: 1st—Plenty of clean soft water. 2nd—Two

good galvanized pails, standard size. 3d—A good strong sponge or two. 4th—Artificial rubbing brick of two kinds, medium and hard. 5th—An asphalt or cement "deck" or platform upon which to rub the roughstuff.

Roughstuff should be rubbed in a part of the shop into which it is possible to introduce plenty of strong, bright light. For cutting the brick or stone to the required shapes and sizes a common "buck" saw blade, partly worn out, will answer the purpose fully. In the selection of stone for rubbing it is advisable to use a coarser stone at the beginning, and as the surface gets down, some change the coarse stone for one of finer texture and for the final smoothing up use the finest stone to be had. In this way more surface may be rubbed, and the quality, in the end, will be quite as good as a fine stone used from the beginning would bring forth. In rubbing roughstuff, use plenty of water; not drowning the surface, but keeping it washed free from grit and filler accumulations. Even the beginner if he keeps the surface washed clean will rarely scratch and disfigure the work. Rub with straight, long strokes of the rubbing stone, and avoid rubbing in circles. A circular motion of the stone is very apt to catch the surface and gouge it into furrows that look like irrigating ditches. Always rub battens or any surface ornament first, along with, usually, the outside surface of the panel. The inner portion of the panel or fancy style surface for that matter, if rubbed first is quite likely to get bruised or injured before the outer strip or border is surfaced to determine how close the surface is getting rubbed, and the particular fineness of such rubbing, draw the dry finger at right angle with the strokes of the rubbing stone, and into this dry strip of surface look sharply, as this will more accurately disclose the condition of the surface than any other method within the reach of the average painter. When the surface has been rubbed so that all the "hollows" and the "hummocks" have disappeared, thus giving an absolutely level surface, and a smooth one, with all the outward coarse nature of the roughstuff worn to a fine finish, the surface may be accepted as properly rubbed. The surfacing of the varnish coats represent a different set of methods and perhaps a somewhat higher grade of skill. The varnish rubbers outfit should consist of the following articles:—Two good galvanized pails; two soft wool sponges; two chamois skins; two wash brushes; a small pail containing No. 00

pumice stone flour; several  $\frac{1}{4}$ -inch thick perforated felt pads for rubbing the varnish, and, if possible, a stout bench light enough to be easily carried about the shop. Supply houses advertising in the columns of the AMERICAN BLACKSMITH, will furnish the perforated pads, and, in fact, any other of the several items above mentioned.

Rubbing varnish is one of those processes which to merely behold looks easy to do, but which in reality belongs to the most difficult features of the trade. A good varnish rubber is indispensable about the carriage paint shop. In rubbing varnish first wash the surface off with clean water, then lay the carriage body, or hang it, as the case and the circumstances may control, so that the body offers a flat, upturned surface to

strokes all in one direction, namely, the longest way of the panel. It requires practice, to be sure, to determine to a nicety when the varnish has been rubbed sufficiently, but generally speaking, these rules may be accepted:—1st—when all motes and nibs of dirt have been rubbed out. 2d—when brush marks and everything foreign to an absolutely mirror-like surface have been eliminated by the rubbing process. 3d—when the surface after washing and drying off with the chamois skin, yields a fine, velvety smoothness perfectly free from anything that will injure the natural smooth finish of the varnish.'

To obtain the best results it is advisable to finish the rubbing by using pulverised rotten stone in a pad kept expressly for this purpose. This last work

second coat of rubbing varnish the carriage body, if of a size to permit it, should be laid down, or tipped in a way to furnish the face of the panel flat down rather than vertical, as when standing in a natural position. The workman may then flow the varnish on one side and on one end of the body, and as soon as it has flowed out and settled to its sure position on the panel, the body is turned completely over and the remaining side and end varnished. A description of the apparatus for holding the body in position during this work was published in this paper several months ago. The advantage of this practice lies in the fact that a heavier coat of varnish may be safely applied, and that varnish runs do not have a chance to form. This is the practice in the best factory paint

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THE WESTERN AUSTRALIA IRON WORKS WITH FREMANTLE IN THE DISTANCE.

work upon. If a large surface, rub the long way of the panel, carrying the strokes clear out to the end of the panel, and avoid the rubbing strokes across the ends of the panel. This latter practice while not apparently proving detrimental to the surface does preceptibly make a difference, as an experiment or two will disclose. The straight rubbing stroke carried directly through to the end of the panel obviates this trouble. We do not advise bearing too heavily upon the rubbing pad as this generates a heat which softens up the varnish, and may in the end defeat the very purpose the rubbing is intended for. Just a firm, even, uniform pressure upon the pad, after dipping it into the pulverized pumice-stone and water will suffice. Keep the pad and the surface freely moistened with water. Avoid rubbing through the last coat of varnish, as this weakens the whole fabric of varnish, and necessitates a lot of unsatisfactory fixing up, or a clean removal of that particular coat of varnish, either of which extreme is bad enough to discourage the majority of men. Do not rub cross-wise or in a circular fashion, but direct the rubbing

with the rotten stone removes any indications of coarseness, and softens down the face of the surface, and fits it finally for the succeeding coat of varnish. If the rubbed surface is allowed to stand over night before it is varnished it should again be lightly rubbed in the morning, before varnishing, in order to remove certain gases and acid accumulations deposited upon the surface during the night. Such accumulations, if allowed to remain and varnished over, develop a train of varnish devilties difficult for the small shop painter to overcome.

Finally, keep all the varnish surfacing utensils—the sponges, chamois-skins, wash or water brushes, pads, pumice stone, etc., in compartments that are at least clean if not dust proof. And, as a last word, endeavor to excel in this work just as you endeavor to excel in varnishing or in doing any other of the seemingly showier processes of the trade.

Connected with this matter of surfacing through the medium of pumice stone water etc., is the art of laying the varnish coats, and the work of cleaning the surfaces preparatory to the exercise of this art. In applying the first and the

shops in the country, and in custom shops, and it is suited to the needs of all painter readers of these pages.

In respect to the last coat of rubbing varnish, and to the finishing coat, it may be said that the immediate forerunner, is the washing and surface cleaning. One of the ablest carriage finishers the writer has ever known has said that—"washing and cleaning is more than half the finishing." Another scarcely less famous finisher has said, "that given the surface washed and perfectly dusted the remaining work of the finish is easy." These observations serve to emphasize the importance attached to the work by experts, and we believe they may be accepted as accurate guides by finishers everywhere. First of all, then, wash the surface *clean*. With the wash brush tool out every bit of surface obstructed by moldings etc., Wash the under part of the body around the edge so that all loose particles of dirty matter are slicked away. Use sufficient flow of water to carry off by sheer force of volume the light surface accumulations. Take careful heed of all moldings, medalions and surface fixtures that naturally catch and

hold dirt in any form. In wiping dry with the chamois skin dry off the surface until only the light vapor of moisture remains. This works no injury to the varnish, and, in fact, produces as a rule, cleaner surfaces than when the chamois-skin is rubbed hard over the surface, and thus made to shed lint and bits of fibre which are invariably hard to dust off or otherwise remove.

Numerous schemes are from time to time suggested by which the surface may be made clean, wiping over with a piece of silk being one of the recommended devices. These, however, are individual inventions which are not followed to any extent by the big shop finishers. These men, once the work is washed clean, depend upon the duster, with the points possibly flicked over with a moisture of raw linseed oil, to clean the surface preparatory to varnishing and as their work stands for itself it is hardly necessary to cite further authority or different new-fangled methods used to-day and obsoleted tomorrow. Use both a round and a flat

This ailment should be fought against and overcome. Then other things being equal, will come success. A cool head and a steady hand are needed in the varnish room. To varnish a panel for illustration:—With the small brush coat in around the edge of the panel. Then with the large brush lay off a full heavy flow of varnish. Then cross brush carefully. Then wiping the brush out, dress the varnish out as laid on, slick up the edges and retire. If your skill has been affective, the varnish will do the rest.

### The Western Australia Iron Works.

A. J. SHORT.  
foreman of smith-shops.

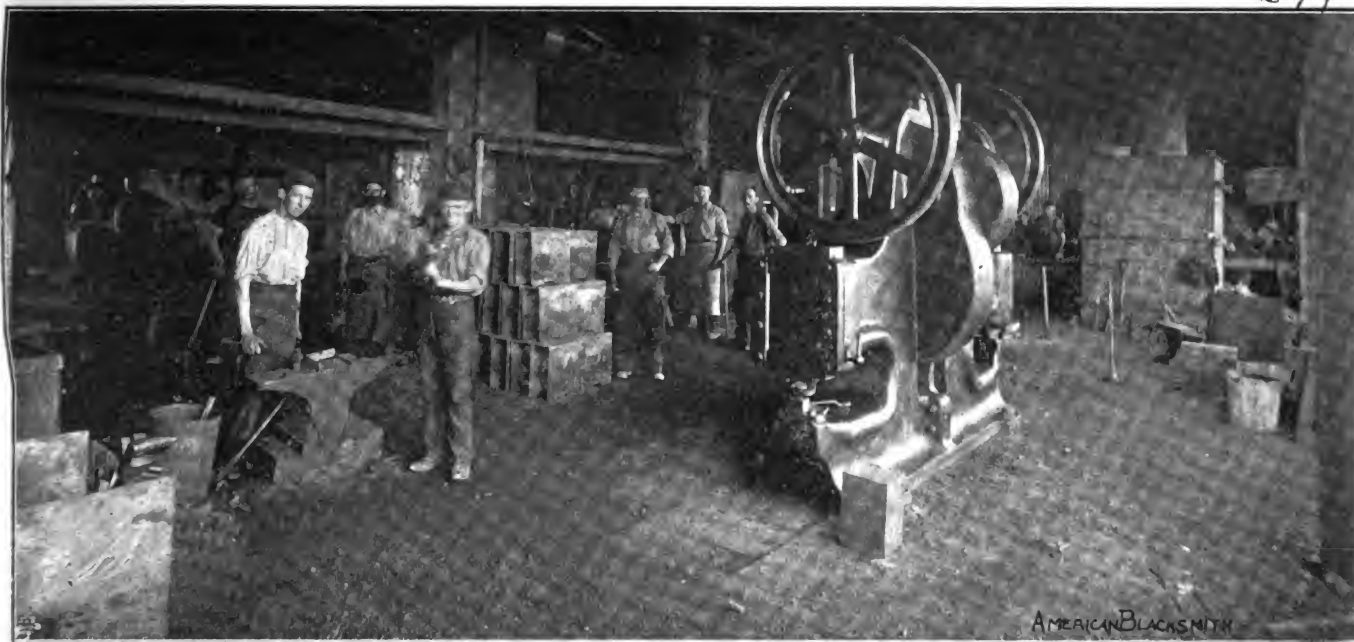
On the Swan River, about two miles from the port of Fremantle, in a beautiful section of the country is situated the new Westralia Iron Works, a new industry in this state. The engravings show an exterior view of the shops and also the interior of the smith shop. A picture is also shown of the first train of railway carriages built at these works.

peared in THE AMERICAN BLACKSMITH. These two forges are of the drop grate variety and are in every way suited for any class of work. We also have one heating furnace, two steam hammers of five hundred-weight each, one hot saw, one emery stone, one cold saw, a combined shearing and punching machine and are at present putting in a foundation for a Bradley Helve Hammer. We also have a large fan system for the distribution of air blast to the fires

The finishing shop, which is 114 by 185 feet is furnished with six sets of rails and can accomodate twelve full length railway carriages at one time. The carriages as built at these shops are said to be second to none, of similar gauge, in the world and with the exception of the wheels, axles and springs all parts are manufactured at these works.

Among other jobs, we are at present engaged on a government order for 100 sets of truck iron work and in the making of trams for Perth. There are about 200 men and boys now employed at these works and the shops have much

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INTERIOR OF THE SMITH SHOP AT THE WESTRALIA IRON WORKS.

bristle duster. The round one for the first or preliminary dusting, and the flat one for the final light catching up of the finest atoms of dust.

Varnishers are rare who have not at some stage of their career suffered an attack, or repeated attacks, of varnish room fright. While this is uncalled for from the point of view of the veteran finisher, it nevertheless is a disease which attacks men, and for the time being, at least quite unnerves them, and leaves them powerless to do effective work.

The carriages, as they are called here are first class in every respect, and are fitted with electric lights and all the latest improvements. They are practically the same general construction as used in England and on the continent, in that they are made up of compartments with side-doors instead of the American style with its two rows of seats, one long isle and two end doors.

The smith-shop at the works is well laid out and contains ten fires, two of which I built from drawings which ap-

the appearance of large bee hives in the honey season. There is every promise of the Westralia Ironworks becoming a leading center of the industrial life in this state.

### Why Do So Few Smiths Have Natural or Ready Ability?

J. M. FIX.

My answer to above question is, they do not allow their brains to act. If one goes to drive a nail, the commonest kind of sense teaches him, that the handle of the hammer must be at right angles to

the nail, providing the face of the hammer is parallel with the handle. If this is not so, allowance must be made so that the force exerted is in a direct line with the nail. If you examine the swages, chisels, flatters etc. used in smith shops, in 19 out of 20 you will find that part of the heads of these tools which is next to the striker, beaten down  $\frac{1}{8}$  to  $\frac{1}{4}$  inch below the part of the tool nearest the smith. Common sense should tell anyone that this style of striking is harder on the striker, harder on the tool, harder on the sledge and harder

it. Most persons bear on a Jennings bit and force it through the wood, when more often it wants to be held out instead. I believe that as a class, blacksmiths are the hardest on tools.

Many men when through using a drawing knife, will throw it down with its edge against a file or vice. A plane is often used in same manner. Now, suppose the smiths time is worth 30 cents per hour and the helper's 15 cents, to grind the gap out of a drawing knife or plane will, of course, require half an hour. Could you make 20 or 30 cents

strike. While, on the other hand, to stand with both feet even and from 10 to 12 inches apart so that one leg braces the other, there is no danger of being thrown out of balance. This position will permit a man to strike anyshape required and with either hand next the sledge. Except in a few instances, always strike the highest point on a chisel, punch or any tool of similar nature. In order to strike correctly raise the handle of the sledge level with the object you intend to strike. In cutting off iron, strike the hard blows first, and then lighten up as

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THE FIRST TRAIN OF RAILWAY CARRIAGES BUILT IN WESTERN AUSTRALIA.

on the smith. Then, you ask why do 19 out of 20 strike this way. It is simply because they are asleep.

When a man is boring holes, in rims, for tire bolts, especially when the tires have been reset and the holes are out of line, why does he break so many bits? Simply because his brain is inactive. He puts the brace against his body and turns with his right hand, holding the wheel with his left. Of course, the wheel moves a good deal and he does not allow his body to move in accordance with the resistance of the brace. Consequently, the wheel in changing position results in a broken bit. Another thing, do not take a death-like grip on the brace, so that in case a sudden and determined resistance is met with, the bit can be saved from breaking. And still another point, when you know the brace turns hard on account of the bit meeting obstructions, take your body away from the brace occasionally and see what position the brace naturally assumes. It will often times surprise you that it did not break sooner, considering the strain that you had on

much easier than by laying these tools down carefully? To return to the helpers branch of this subject, he will frequently strike the chisel three or four blows when cutting a piece of iron and if it does not come off as soon as he expects he will hit the chisel a very hard blow. Of course, the iron was almost cut through and the result is a good chisel completely spoiled and time wasted in resharping, or, perhaps, other and more serious results. Just recently the writer's left hand was temporarily paralyzed by a careless helper striking before the proper time and hitting the chisel on the side.

I have often said that a man cannot become a first-class striker, except in rare cases, unless he places his feet in proper position. The proper position to stand is with both feet even and directly facing the anvil. The sledge handle may then come between the legs or to either side, which ever is most convenient to the striker. When the helper stands with one foot behind the other, the least thing may throw him off his balance and is liable to cause a mis-

you cut farther. Cold punching comes under this head, but hot punching is entirely different. Light and quick striking affords the best results if the iron is thick and the smith will move or twist the punch a little at the very moment the blow is struck, the punch will not often stick. But if struck slow and hard the punch will bend and stick. I have seen older smiths than myself have a sad time with the punch bending and sticking. There is no excuse for this trouble if you use judgment, but it takes time to teach the helper judgment.

### Tools For Forging Hexagonal And Square Nuts.

C. H. RICHARDSON.

It is necessary when forging hexagonal nuts to have a tool to shape them in. The tool as usually made is shown at A; although this tool keeps a true hexagonal shape on the outside there is nothing to prevent the mandrel from making a crooked hole in the nut and a nut with a slanting hole is not only hard on the tap but also weakens the bolt to which it is applied. The tool should be



made as shown at B. That is, first to make a block like A, the correct size of the nut on the out side. Next, make a band to fit around the block as shown, weld a handle on the band and shrink the band on the block. Then cut out the part shown at S for the mandrel to rest in. It is impossible to make a crooked nut with this tool as the mandrel lays level on both sides of the tool and the hammer strikes it level on the top, while the hexagonal shape holds it firmly at the bottom. No matter how crooked a nut is the tool will straighten it if the nut is turned after each blow of the hammer.

When using this tool, the stock selected to make the nut should be a half inch thicker than the width of the nut across the corners, and  $\frac{1}{4}$  of an inch less than its required thickness. These sizes allow the nut to drop easily into the tool when hot. The stock added to the width of the nut allows for the wasting and hammering, while the  $\frac{1}{4}$  of an inch less on the thickness keeps the nut from jamming in the tool and allows the faces for ends of the nut to be finished at the same time. After the nut has been properly welded it is taken off the mandrel and chamfered with the cup tool shown at C. Jamb nuts are cupped on both sides. One tool is sufficient to do this and all that is necessary is to reverse the nut and then replace it on the mandrel and finish off.

A plan for making square nuts is shown at D. Anyone who has made large square nuts, can readily see the advantage of this tool, the most prominent feature of which is the way it sharpens the corners with comparatively few blows of the hammer; and the solid weld that results.

The simplest way to make this tool is first to make two V blocks, arranging the V's so that when they are laid together the square hole will be the size of the nut required. In the one to be used for the top half of the tool, punch a  $\frac{3}{8}$  hole and shrink a handle in it as shown. Now make a band for the lower half as previously spoken of only leave it project high enough to form a socket for the top half to drop into while working, this socket holds the two halves of the tool in place and makes their handling very easy.

There are a few things I wish to say in regard to the shaping of the nut. First, the circumference is found by multiplying the diameter of the hole plus the thickness of the stock (as at X) by  $3\frac{1}{2}$ . Second, do not upset the stock on the ends for welding and never scarf the piece. This may seem strange but

please note the following: It makes no difference whether the stock used is drawn from larger material or bought in bar sizes, it should be cut hot. The piece being cut through from one side leaves a bevel on it. Both ends are cut this way. Now rest the hammer on the piece and bend the two ends down with the sledge, stand it on end and let the steam hammer hit it. Next, set it on a V tool as shown at E, and with a cutting hack drive down the beveled edge to the mandrel as shown. Now straighten the piece so the hammer can hit it squarely and then bend it around the mandrel as at F. Now place the

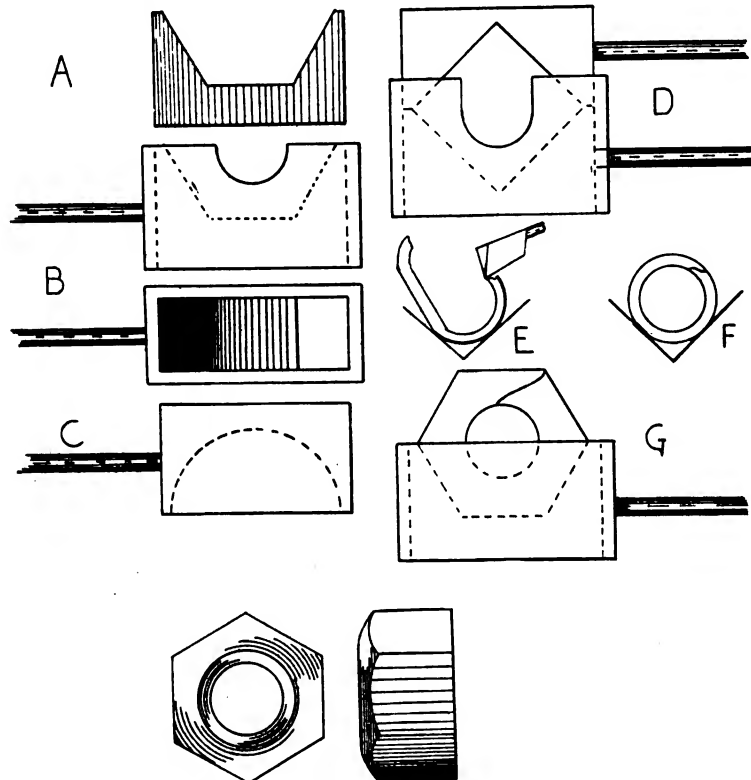
of bolt  $+\frac{1}{4}$  inch. Short Dia. of finished  $= 1\frac{1}{2} \times$  dia. of bolt  $+\frac{1}{8}$  inch. Thickness of rough nut  $=$  dia. of bolt. Thickness of finished nut  $=$  dia. of bolt  $-\frac{1}{8}$  inch.

The long diameter of a hexagonal may be found by multiplying the short diameter by 1.155; and the long diameter of a square nut by multiplying the short diameter by 1.414.

### Building New Work in Small Shops.

G. W. HOPKINS.

I think there never was a better time for building new work in the ordinary wagon shop than now. The smith who expects to get the best repair work must



TOOLS FOR HEXAGONAL AND SQUARE NUTS.

rounded collar in the "hex-tool" and shape it to the desired size already spoken of, being sure to keep the lap on the corner as shown at G. This is the only secret in nut making that does not show itself at once to the workman, and is the reason the laps are left short, the stock gathers in the corners and welds at once while the flat parts of the nut draw and cool off and therefore render a long scarf in nut making impractical. After the nut is properly shaped and ready for welding, one heat should finish it no matter how large it is. In the case of the square nut the same plan holds good and requires no further explanation.

The following rules I add for the benefit of the craft. Their worth is well known. Nuts and bolt heads are determined by the rules, which apply to hexagon and square nuts.

Short Dia. of rough nut  $= 1\frac{1}{2} \times$  dia.

have a good wood-worker who knows his business. I do not believe that the ordinary man is capable of working at several different trades and making a success of any of them. The next thing is to make arrangements to keep busy. Experience teaches all of us that if we depend entirely on job work there will be times when we will have nothing to do. But making arrangements to put up a few common lumber wagons, we can put in our time very profitably and also bring more people to our place of business for I know from experience that if you put out new work where it can be seen there will be many to look at it who are not in the habit of coming to see you and in time you will get their custom.

I bought my present business just eighteen months ago. After I had been here about three months I concluded

to put up some wagons, so I got material for two and built them. We were nearly three months selling them, but I kept building, and during the next six months we sold four wagons and one buggy. During the last six months I have sold seven lumber wagons and two buggies and have now three wagons and two buggies finished and in the show

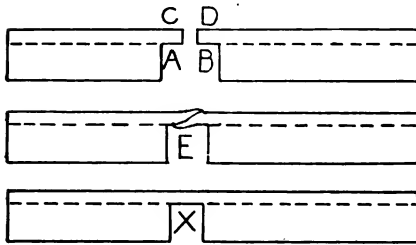


Fig. 1.—SHAPING AND WELDING ANGLE BARS.

room. We are continually getting orders for special wagons that people thought could never be built at home until we began to put work out for them to see. We are getting a better class of repair work than we had before and are getting our pay for all the spare minutes, besides increasing our repairing and general job work.

To do this we have two men in the blacksmith shop most of the time and one in the wood shop, but they are good workmen in their lines, for I do not think it pays to have a poor man around at any price, for it always takes him longer to do a job than it does one who understands his business and then it is usually unsatisfactory when done. I also find that the majority of the best customers are willing to pay more for a wagon made at home than for a factory made one. Of course they will not unless you can assure them that you are building a superior article. But when you can do that, you will find a ready sale for your work at good prices.

### Shaping and Welding Angle Bars.

O. H. RICHARDSON.

Angle bars seem to give the average smith more trouble than any other branch of forging. The mere mentioning of work of this character in a shop where a smith is required will keep them away. Knowing this, I take this opportunity to present the following sketch and article.

Men as a rule when welding angle bars, scarf them as any plain bar, then lay them together and try to weld the heel first. I have never seen this plan make a first class job. The smiths object in doing it is to accomplish the task in one heat. I know that it is next to impossible to do it because be-

fore the heel is properly welded the edges are too cold to even stick and nearly always have to be thickened up and some compound placed between them before they will weld. I have even made dies for the hammer to do this work, but have always had the same results, the edges not being welded.

Fig. 1 represents the method used by the most scientific angle worker of today and any one can see at a glance the theory of it. First the two sides are cut out as shown at A B, leaving the other flange the full width. The two ends of the flange marked C D are now upset and scarfed, so that when they are laid together they look like E. The weld is now made as in the case of any flat bar iron. This will leave the other flange about  $\frac{1}{4}$  of an inch open. This flange should now be scarfed to a thin edge. The piece is used to fill in should be just the thickness of the flange and the width of the opening plus the required amount for the lap. This should not be scarfed because the steel bar is so much harder than the iron filling-in piece, that the latter works right into the former flush and clean leaving a perfect heel and welded edge. If this plan is used the work can be done in two welding heats.

to mark the spot of the offsets, with a cold chisel, on the heel of the bar, and on the side of the flange as shown at K. The chisel is to be held slanting so that when the notch is cut out of

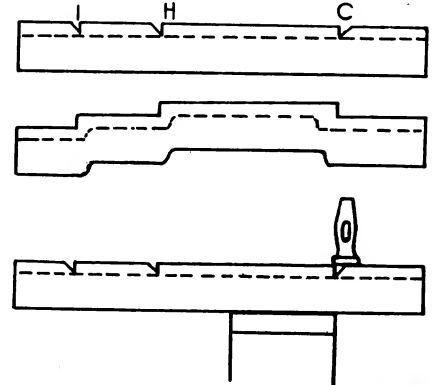


Fig. 2.—SHAPING AND WELDING ANGLE BARS.

the heel of the bar, it will show the workman which way the jog goes on the flange, leaving no chance for making a left hand piece when a right hand one is required. The square corner left by cutting out the notch forms the heel of the offset. A sharp edge set hammer is placed at L and the heel of the bar is set through the depth of the required offset. The flange or the opposite leg is now finished. This plan makes a neat fitting job, but if the thin flange was worked first,

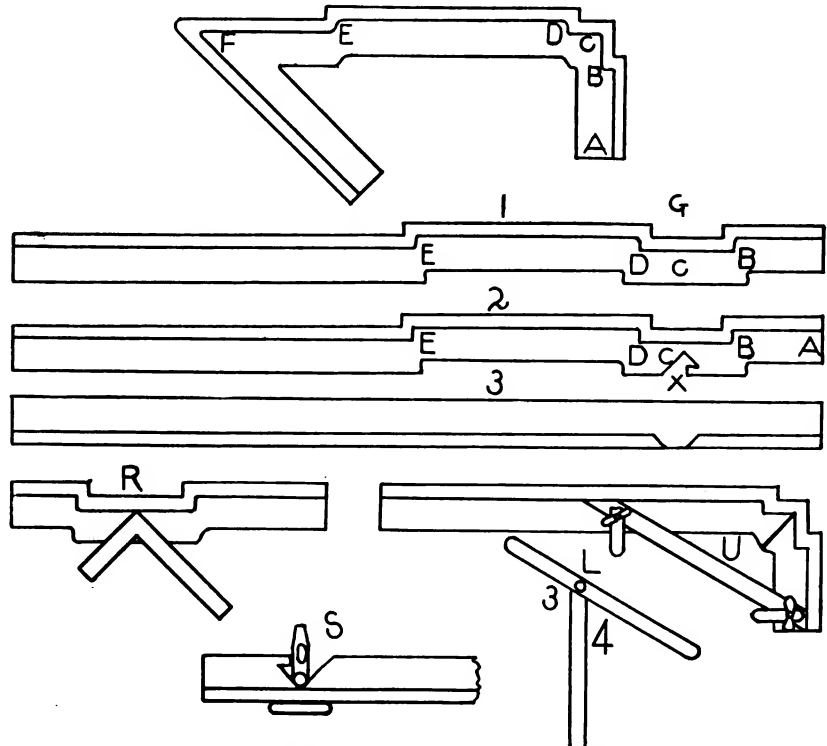


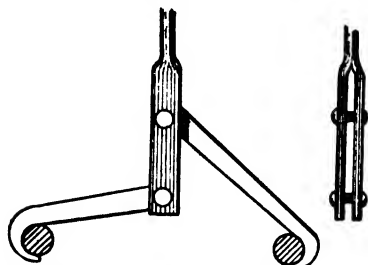
Fig. 3.—SHAPING AND WELDING ANGLE BARS.

Offsetting or jogging an angle bar is shown at Fig. 2. These offsets have to be done neatly so they will match the bar they fit over. The simplest way to make these jogs as shown at G H I, is

when the heel is sunk the flange would straighten out, the heel being the thickest it draws the flange toward it. If the whole width of the bar is worked at once it is impossible to get a square

corner, which is necessary in all iron to iron fittings.

Fig. 3 represents an angle bar staple that is used in iron ship building. This is a piece of work that includes all the hard kinks of the angle worker. The first step after cutting off the bar is to start from the end A, and mark the offset B and D allowing no stock to form the jog. When the weld is made the corner draws enough to make up for this. Finish the distance between B and D as shown at G and lay off the distance D C. Then make the offset. Now with an ordinary square laid on the flange to be cut out, the heel of the square being centered as at R at the point of the corner to be, draw the angle that is formed by the square, leaving half the thickness of the flange on each side of the cut to allow for welding. Now cut out the triangle piece, holding the chisel at a slant so the scarf will be made at the same operation. The small tail on the edge of the flange at X is left there to thicken it and to make a full round corner, when it is



ANOTHER TOOL FOR PUTTING ON RIMS.

welded. The cutting is made in the same heat. The bar is then turned on the other flange and a link welded on as at S, wide enough to allow the flange to be sunk into it with a fuller. This is done to form the corner. Now push the corner over the edge of the anvil and with a sharp blow on the heel bend the corner into shape. Now clamp it as shown at U so it will not shift while welding. Then heat the work in a fire, built level with the forge and nothing but a common fire brick over it. This plan insures a good heat, while the forge being leveled keeps the work straight.

The corner F should now be made. The only way to do this, without chance for error, is to take a T bevel square and set it to the angle of the head as at L 4. The smaller angle represented by 4, being the side to be cut out and 3, the larger angle representing the amount to cut out. Now lay the bevel on the flange the same as the square was used and arrange for welding as previously spoken of.

To prove the angle square is right,

we can refer to one of the first steps in geometry which tells us that if one straight line meets another straight line at a point between its ends (see our angle square) the two angles thus formed are called adjacent angles. When the adjacent angles are equal, they are called right angles. So, with the first welded corner, if we had used the T square instead of the common square we would have had an equal angle on each side of the leg of the square, while with the latter we have on one side the open or greater angle, and on the other side we have the acute or lesser angle, the two combined equalling two right angles or 180 degrees equal to one-half of a circle.

#### Another Tool For Putting on Rims.

S. P. THURMAN.

Here is another tool for use when fitting rims on the spokes. The accompanying engravings shows the construction of the tool very plainly and little explanation is needed for a proper understanding of its making and working. The hooks should be about five or seven inches apart and of a weight and size to be determined by the class of work generally done. When ready to use the tool insert one spoke in the first hole in the rim and then place the lower hook of the tool over this spoke. Now catch the upper hook over the second spoke and pull lever until second spoke is in proper position for inserting in hole.

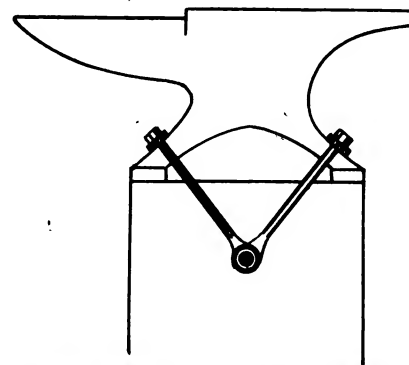
#### Fastening the Anvil and Deadening its Sound.

J. C. SHAY.

This question has always been a puzzle to me, until reading the answers published in *The American Blacksmith*. It set me to thinking and as a result I have made a discovery by which the anvil can be securely fastened and at the same time and by the same device be as devoid of ring or sound as the coin you expect from an out-lawed bill. If your anvil block is wider than the base of your anvil, saw into the block about 15 inches below its top and hew off sufficient to make the base of the anvil set flush with the block. Then bore a  $\frac{1}{4}$ -inch hole 10 or 12 inches below the surface of the block and entirely through it on a line. Next make four  $\frac{1}{2}$ -inch bolts with  $\frac{1}{4}$ -inch eyes also one  $\frac{1}{4}$ -inch bolt long enough to go through the block and take two eye bolts on each side. Then make yokes of  $\frac{1}{2}$  by 1-inch stock and punch or drill  $\frac{1}{2}$ -inch holes in each end. Now measure your anvil so as to have the bolts hug the anvil closely. Then put your  $\frac{1}{4}$ -inch bolt through the block, slip on your eye bolts

and put on clamps and nuts. Now tighten all nuts and keep them tight and you will have no more anvil troubles.

I have been 8 years in my present location, own my shop and owe no one a dollar. I also have a homestead of 160 acres on which my shop stands. The famous Yosemite Stage road passes my door. During my 8 years in this location I have not lost 8 dollars, but when a man owes me, I camp on his trail until he pays. Death or poverty are the only two excuses on which I will cancel a blacksmith bill. I have broken the record here by keeping my shop o-



TO FASTEN THE ANVIL AND DEADEN ITS SOUND

pen 7 years longer than any other man who has tried to run a shop in this community, I was also the first man in the county to raise the price of shoeing and before I ever cut it down I will quit the business. A man who will cut the price of shoeing is a disgrace to himself and his fellow workers.

#### An Oregon Shop for General Work.

JOHN P. JONES.

My shop is situated in Richland, Oregon, the center of the mining and stock raising region. I have a custom averaging \$2,900 per year, the work being well distributed throughout the year so that two men can do the work excepting for about three months. The work consists mostly of horseshoeing and wagon work, although there is some plow and machine work also. The prices of work are as follows:

Horseshoeing .....	\$2.00 to \$2.25
Resetting, per shoe .....	.25
Wagon tires .....	4.50
Buggy tires .....	2.00
Setting axles .....	1.50
Spokes in wagon .....	.35
Buggy spokes .....	.25
Felloes .....	.25

The shop building is of wood and is 58 feet by 20 feet. I have two complete sets of blacksmith tools, all first class. They are as follows: One tire setter and welder; one Stoddard upset; one Canedy Otto drill press; one blower; one tire roller; complete set of taps and dies, and two anvils.

### To-day and To-morrow.

ANONYMOUS.

Don't tell me of to-morrow,  
Give me the man who'll say  
That when a good deed's to be done,  
"Let's do the deed to-day."  
We may all command the present,  
If we act and never wait;  
But repentance is the phantom  
Of a past that comes too late.

Don't tell me of to-morrow,  
There is much to do to-day  
That can never be accomplished,  
If we throw the hours away.  
Every moment has its duty,  
Who the future can foretell?  
Then, why put off till to-morrow,  
What to-day can do as well?

Don't tell me of to-morrow,  
If we look upon the past,  
How much that we have left to do,  
We cannot do at last;  
To-day it is the only time  
For all on this frail earth;  
It takes on age to form a life,  
A moment gives it birth.



A very Merry Christmas again.  
Leisure is good only when the reward of labor.

Prevent wrong doing by checking the least tendency to wrong thinking.

A most acceptable Christmas gift is a year of THE AMERICAN BLACKSMITH.

An important factor in good smith work is coal. Is your's all it should be?

Answer the questions in this issue. At least one touches your favorite topic.

Trouble in any line of your work? State your case fully. We will try to help you.

Has it lapsed? A good business man never takes any chances with his fire insurance?

If pleasures are greater in anticipation how much more is the same true also of troubles.

Ordered your fifty calendars yet? Better hurry—It's not too late if you write immediately.

A prominent advertiser says, "If your business isn't worth advertising, advertise it for sale."

Carelessness, the mother of forgetfulness, is nothing more than the continual taking of little risks.

Greatness is always measured by benefits to others. Great men are always great benefactors.

Electricity or acetylene—which do you use for shop-lighting? Let us hear from you on this subject.

A good craft book as a Christmas gift will not only please the helper but will make him more valuable to you.

Awaken your customers with several good strong blasts of the advertising whistle, if business is slack down your way.

A good time to cut out un-necessary expenses. Begin the new year right by practicing your resolves at the old year's end.

Recent statistics show the length of the world's railroads to be 537,105 miles. Their value is figured at forty-three billion dollars.

In cold weather, the gasoline engine demands special treatment. Careful observation is necessary to successful running.

Your favorite journal—what part do you like best? We can work together to mutual advantage. Suggestions are most welcome.

This last month of the old year—why not get one new subscriber? We want to issue a 50,000 edition regularly and you can help us.

Cut through Solid rock is a recently completed tunnel on the Louisville and Nashville Railroad. It is nearly a mile long and cost about two-million dollars.

Compare 1905 with 1904—has your business increased? If not, something's wrong. Resolve to outdo all previous years in 1906. Fifty calendars will start you right.

"The neat appearance of my shop," said Thornton, "is due to the fact that we have a place for everything and insist upon everything being in place when not in use."

Have you thought to contribute an item or two in the past year? Don't let another issue go to press without something about your shop, prices, tools or equipment.

A robber of man's opportunities and not only a thief of time, is procrastination. His chances of success are increased a hundred fold, who allows it no place in his life.

Lots of Smiths are extending their subscriptions two and even three years by getting new subscribers to the journal. Have you tried this method of paying for your paper? Write for explanation of the plan.

Another big issue of the AMERICAN BLACKSMITH will go out in January. It will be the best yet and 50,000 copies will be sent out. If you know any craftsmen who would be interested in this special number, send in their names.

Over a dollar a pound was the price paid for a shipment of ten tons of uranium ore sent to the Krupp Steel Works at Essen, Germany, or nearly \$2500 per ton. The ore is used in connection with the Krupp process of hardening steel. The production of this rare mineral is limited to but a few places.

An Ingenious Method of forming a concrete dam was followed recently at Niagara Falls, Ontario. A column 7 feet 4 inches square and fifty feet high was built on a staging at the water's edge and tipped over

when completed. The operation was successful; the column falling within six inches of the spot planned.

Much discouraged, Tom was saying the other day, "The craft is going to the dogs. Prices are not what they used to be and jobs scarce as hen's teeth. They say competition is the life of trade, but I guess it's been the death of mine. However a man is going to live on the prices I don't know. Why those shops up the street are after my trade so that I have to cut prices to save myself."

"Nowhere in the world do horses have such good and strong and dependable feet as in Virginia" says a well-known horseman. "The only rational explanation is that the red clay soil of the State gives extraordinary firmness, and likewise unusual growth to the hoofs and keeps them in permanently good condition. I've known plenty of horses down our way that lived to green old ages and never knew what it was to be shod.

"So high an estimate do I place on the red mud of Virginia that I always carry a plentiful supply of it in making my racing rounds, applying it freely to the hoofs of my horses when in their stalls. This is the next best thing to letting them run at large in their native clay, and keeps the pedal extremities in fine shape."

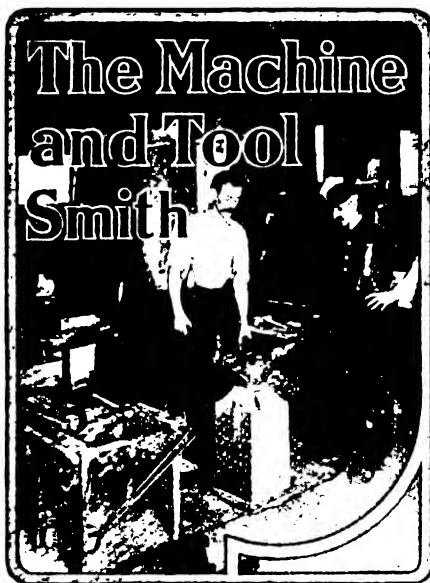
An Invention which relates to the manufacture of artificial granite for use in building and other purposes was recently registered. The object of the invention is the production of a cheap and durable material, which, when set, has the appearance of granite, and which can be used for many, not all, the purposes for which natural granite is employed. Granite or marble chips, or both, are taken and mixed with a suitable proportion of cement, water, coloring matter, and other ingredients, if desired, until it forms a hard, consistent paste. The mixture is then placed in molds, in which it is allowed to remain until set, after which the blocks are removed and immersed in water until they have absorbed sufficient moisture. They are then removed and placed in a warm and shady place until they have attained the required dryness and hardness, after which they are polished.

A remarkable structure is the steel bridge now under construction over the St. Lawrence River at Quebec. The weight of this bridge will be about 35,000 tons. Its span of 1,800 feet crosses the entire St. Lawrence River at such a height as not to interfere with navigation, and will be the longest in the world, the Forth bridge in Scotland being 1,710 feet long, the Brooklyn bridge 1,680 feet, and the new East River bridge in New York 1,600 feet. There have been manufactured by the Phoenix Bridge Company, Phoenixville, Pa., to date, and partly shipped to the site of the bridge, about 10,000 tons of steel. The 1,800 feet of steel-bridge work between the piers will be erected without any false work in the river. The bridge is to be 80 feet wide over all, carrying a double-track railroad, a double-track trolley and highway, and two sidewalks. Many novel features have been adopted in the design and manufacture of this bridge. The total length of the bridge will be 3,300 feet; ship clear headway, 150 feet above highest tide; height of cantilever towers, 360 feet above the river.



### American Association of Blacksmiths and Horse-shoers.

The time for Lien Law Agitation is again drawing near. Legislatures in many of the states are about to meet and if you desire to help along the movement for better legislation for the blacksmiths, horseshoers and wagon makers, drop a note to The American Association, P. O. Box 974, Buffalo, N. Y. The support we ask of you is for your own benefit and will involve no expense. A postal will do if you haven't time to write a letter. Just tell us whether or not we can rely upon your support during the coming legislative sessions. The blacksmith and his associated craftsmen have lost any amount of money through bad debts and they should be willing and anxious to work and agitate the cause of such legislation. Write us now—immediately—on this matter. Also drop a line to a brother smith or two asking their opinion of the matter and telling them also to write us. This will not take five minutes of your time and the benefits at stake are great. Will you lend your personal backing to the extent of a small effort? Do it now—while you think of it.



### Hardening And Tempering Steel.

3.  
E. R. MARKHAM.

Should we consult the dictionary for the meaning of the word anneal we would find it defined as the operation of heating a piece of iron or steel to a red heat and allowing it to cool slowly in order to make it soft or workable. Generally speaking this definition is correct. Articles of iron and steel are annealed in order to soften them sufficiently so they can be machined. At times, how-

ever, it is necessary to treat steel in annealing in a manner that will rid it of strains; or it may be necessary to toughen it, or produce some other effect. These various methods and the operations involved will be considered under the proper headings.

There are many methods employed in the annealing of steel when the only object sought is a workable condition. The method employed depending many times on the facilities at hand, or the ideas of the man in charge. However, the successful workman understands that he must vary his method to meet the desired effect. It must be understood at the start that annealing is a process of *slow* cooling from a red heat. As it injures a piece of steel to remain red hot for any considerable time, the cooling to a point just below the refining heat should not take a great while. But from this temperature, the cooling off should go very slowly. The slower the piece cools down to a temperature of 300° or 400° F. the softer it will be.

Many times, pieces of steel are heated red hot and allowed to cool off in the air. In case of an emergency this answers the purpose, and under certain conditions it is a desirable method. But care should be exercised so the piece does not come in contact with any cold or damp substance. For in such a case it would be chilled and consequently hardened to a degree. Neither should it be placed where a current of air can strike it.

Care must also be exercised so that the steel is not heated too hot. High heats open the grain of the steel and make it hard. Although steels, which do not contain a high percentage of carbon, will stand a higher heat without injury than one which does, nevertheless it is *never* advisable to over heat steel when annealing. Right here many unskilled men make a serious mistake. They attempt to anneal a piece of steel and in some way treat it wrongly. The result is the piece does not work easily and the workman thinking he has not given it sufficient heat will try again. This time he heats it hotter than before. It is returned again and each time he gets it back he heats it hotter than at any preceeding time. The result is a piece of spoiled steel, and the blame is laid to the steel. Steel can not be overheated with impunity. And as the operation of annealing should be one of softening, it is apparent, that anything which makes the steel hard or unfit to work is not the result desired and it is to be avoided. Consequently steel

should never be heated hotter than if it were being heated for hardening.

A very satisfactory method of annealing if carried on properly consists in placing the heated piece of steel in ashes or lime to cool. In order to get satisfactory results the steel must be given a uniform heat of the proper temperature and the ashes or lime must not be cold or damp. To avoid this difficulty, a scrap piece of iron or steel should be heated and placed in the box of ashes or lime while the steel is heating. When the piece to be annealed reaches the proper uniform heat the piece of scrap should be removed and the steel buried in its place. Many blacksmiths fail to observe this precaution and as a consequence the operation of annealing is any thing but satisfactory, especially if the piece is small or thin. I have seen steel that had been through the "motions" of annealing that was much harder than other pieces cut from the same bar which were machined without annealing.

When red hot steel is brought in contact with damp ashes, lime or other material, steam is formed, and steam if in contact with heated metal absorbs the heat. This is especially so if it has a chance to escape. Thus the heat is radiated very rapidly, as the steam works its way through the ashes, so it is apparent, that unless the material is dry the operation is really one of hardening rather than softening.

An excellent method of annealing and one which the writer has used for years, consists in placing in an iron box, one or two inches of ashes, on this place a piece of board a trifle larger than the steel to be treated. The piece is then carefully heated and placed on the board and another board placed on top of the steel as shown at A in the engraving. The whole is now covered with warm ashes. The boards smoulder and absorb enough heat to reduce the heat in the steel quickly to the desired temperature. When this is reached the boards are nearly at a red heat and the steel cools very slowly.

The writer has in mind six die blocks annealed for a concern who made a specialty of engraving. When the blocks were received they were so hard it was not possible to plane them. They were returned and again heated. This time hotter and for a longer time than before and of course were found to be harder than before. The operation was repeated and the blocks were worse than ever. The engravers then sent the blocks to the concern the writer was with, and the results of the previous attempts were

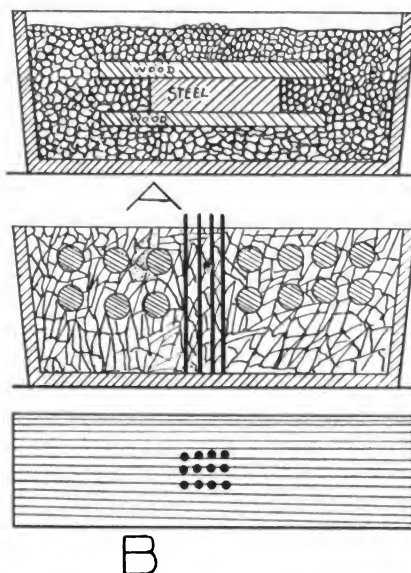
made known. We annealed them by the method given above and they were pronounced all right. From what has just been written it is apparent that high heats, and heats which are maintained for too long a time are to be avoided as they render steel unfit for use. However, unless the steel has been burnt, it can be restored by right heats and proper treatment.

A very common method of annealing in shops provided with the proper facilities, consists in packing the pieces in an iron box with powdered charcoal and subjecting the whole to the heat of a furnace for a length of time depending upon the work then allowing the whole to cool slowly. This method is attended with varying results. In the first place the steel is apt to remain red hot for too great a length of time. And unless the operator is skilled in this particular method of heating he is liable to over heat, or to heat the contents of the box in anything but a uniform manner i. e. the pieces nearest the outside of the box will be much hotter than those at the center. To determine when the contents of the box is red hot it is necessary to use "test wires". These are shown at B and are generally of  $\frac{1}{8}$ -inch wire. They are run down through  $\frac{1}{4}$ -inch holes in the center of the cover of the box, as shown. When packing the pieces in the box care must be taken that none of the pieces are located within  $1\frac{1}{2}$  or 2 inches of the box at any point, especially if the box is of cast-iron, as this metal has an affinity for carbon and will take it from the steel when placed in contact with it.

A mistake made sometimes is packing articles of tool steel in cast iron dust or chips. The writer recalls a case where several thousand forgings were procured from a prominent firm making a specialty of drop forging work. These forgings were ordered annealed and after machining to size and shape we attempted to harden them but found it impossible. Investigation revealed the fact that while they were made from .45 per cent. (45 point) open hearth steel, samples of which hardened nicely; the pieces after being forged were packed in cast iron chips and annealed. This reduced the carbon to a point where the pieces would not harden. In order to do so we found it necessary to pack them in iron boxes with powdered charcoal and subject them to heat for about 24 hours after they were red hot. They were then allowed to cool in the boxes. After cooling, the pieces were found to harden very nicely.

But to return to the method of an-

nealing known as "box annealing". The pieces are packed in the box with powdered charcoal, and so arranged as not to come within  $1\frac{1}{2}$  or 2 inches of the box or within  $\frac{1}{2}$  inch of each other. When the last layer is within  $1\frac{1}{2}$  inches of top of the box, the box is filled with charcoal and the cover is placed in position and sealed with fire clay. The test wires are now run down through the holes in the cover to the bottom of the box as shown. When the fire clay is dry the box may be placed in the furnace and heated. When the work has been in the fire for a period that would seem to insure its being heated through, the operator should remove one of the test wires. If the test wire shows red hot its entire length you may be sure the contents of the box are of the desired temperature. If it is not red, wait a few



ASHES AND CHARCOAL ARE USED WHEN ANNEALING.

minutes and draw another wire and so continue until one is drawn that shows the desired heat. After a few trials the operator will in all probability be able to gauge the length of time without the use of test wires, provided he is able to discriminate between various heats. Then again, the appearance of the interior of the furnace is different on a dark day than it is when the light is bright. For this reason many modern shops have their furnaces so located that the variations in light do not materially affect the light in the furnace room. When the boxes are uniformly heated throughout they may be removed from the furnace and placed where no draught, or moisture can come in contact with them and they are then allowed to cool slowly. As stated, the above method gives varying results; but if the operator is skillful, watches his heats carefully and does not allow the work

to remain too long in the furnace he will get uniformly good results.

The above method works nicely when applied to pieces made from low-grade steel which needs annealing. At times it will be found beneficial to pack such pieces in the annealing box with expended bone,—bone that has been used to carbonize pieces that were case hardened. The expended bone has an affinity for certain elements in the steel and absorbing these elements leaves the steel in good condition. But bone should ever be placed in contact with tool steel.

When softness is the only condition sought in annealing forgings from low grade steel, it is policy at times to pack them in cast iron dust or chips. It is necessary at times to anneal small iron castings, parts of sewing machines, type writers and similar things. An excellent anneal may be given such pieces by packing them with expended bone and heating them for quite a time.

They should be allowed to remain red hot for some time—small castings about 2 or 3 hours and larger ones correspondingly longer. In this respect these pieces differ from tool steel, which should not remain red hot and longer than is absolutely necessary. These castings should cool very slowly, as the carbon is then free in the iron i. e. not combined with it, and consequently the iron is soft. If it cools quickly the carbon, or a greater percentage is combined with the iron and makes it hard.

At times pieces of low grade steel are rendered unfit for use by being packed in charcoal from which they take carbon. This extra carbon can be extracted, by packing the pieces in a scale that flies from the surface of iron or steel when it is forged. This scale being free from carbon has a great affinity for it and will take it from the steel. Of course when the desired object is the decarbonization of the steel it must be left red hot for a period of several hours. It is then allowed to cool slowly to insure a soft condition.

Another method of annealing used in some shops, and which is the means of ruining many tons of steel each year, consists in placing large pieces of steel, die blocks and similar pieces—in a large furnace, and subjecting them to heat until they are of the proper temperature then shutting off the fire and allowing the steel to cool with the furnace. The furnace walls being thick and thoroughly heated cause the steel to remain red hot for a long time and in this way render it unfit for use, as it sets up strains in the block, thus making it liable to crack when it is hardened.

That method known as cold water anneal is a method known to almost every blacksmith in the world, and is used by them with varying success. As generally practiced, it is a source of annoyance to the one called upon to machine the piece, as it is found to be soft in some places and hard in others. To give a piece of steel a water anneal, it must be heated red hot then allowed to cool in the air, it being held in a shaded place until the red disappears, when it is plunged in water and allowed to remain until cool. It is apparent that the red will disappear from any light projections, or from the ends of the piece before it will from the balance, where there is a greater body of metal to hold the heat. So to get best results it is necessary to occasionally heat the ends or any light projections in order that they may cool off uniformly with the balance of the piece. While it is customary to dip in cold water much better results are obtained if your pieces are dipped in warm soap suds or in oil.

The annealing of articles made from sheet steel, or the treating of thin articles in general is attended with more or less difficulty. It is the custom in many places to pack them in a box and subject them to heat until they are red hot when they are allowed to cool slowly. But in this method the pieces near the walls of the box are red hot long before those near the center and it takes the mass a long time to cool below the red. As a consequence they are in no condition for any machining operations. This is especially the case with pieces that are to be bent cold, and which are annealed to soften sufficiently for this operation. After being subjected to the heat mentioned for a long time they will in all probability be found as hard or harder than they were before heating.

The writer has annealed such work as this in batches numbering many thousands and with unvarying success, by heating to a low red then dropping in a box having a layer of hot ashes in the bottom to prevent chilling the pieces. The pieces heating rapidly were dropped in on one another and thus the cooling went on very slowly. Where large furnaces were at hand they were heated by the hundreds and as soon as they were red were drawn out with a rake and dropped on a piece of red hot steel iron. As the others heated they were placed on top of these and in this way there was no possibility of chilling, did not remain red hot for a great time and the results were uniform and satisfactory. When the pieces were machined they were found in good condition, and when har-

dened excellent results followed because they had not been ruined in the annealing. (To be continued.)

### Making And Tempering Drill Steels.

J. C. LAMONS.

In making and dressing drill steels the first thing to be taken into consideration is the nature of the substance to be drilled, your conclusion then will enable you to determine the shape of drill to be used. For machine drilling four styles of drill bits are generally used i.e., the  $\times$ , the  $+$  and square chisel bits. For hand drilling two styles are used, the diamond point and the round bit. The accompanying engravings will give the reader some idea of the shape of drill bits as are generally used.

In machine drilling from 400 to 600 blows are struck per minute of from 200 to 1000 pounds each and if a good grade of steel is not used the steel will splinter and wear away very rapidly especially in hard rock. A machine drill has a set of several drill steels the number depending on the depth of the holes to be drilled. The shortest is usually two feet long. The others increase by steps of 12 inches up to any length it is desired to drill holes. The blacksmith should

Always keep the steels straight, and the shanks in line with the steel as a crooked shank throws the drill piston out of line and will cause the drill bit to stick.

In sandstone and slate quarries a flat-blunt or chisel bit is used as shown in Fig. 1, A. For uniform rock the square form B gives the best results. Where the rock is seamy or has flint streaks the  $\times$  bit is used. The probability of its striking twice in the same place is removed and thereby it prevents sticking and rifling the hole.

Three methods of tempering machine drill steels can be used where the rock is very hard, such as "nigger heads" and stone having flinty streaks, etc. The writer has found the following methods of tempering very successful. First have a large tub or better a square box  $3\frac{1}{2}$  by  $3\frac{1}{2}$  by 4 feet filled with clear soft water. To this add salt until it is briny. Then place bricks in the tank until they nearly reach the surface of the water. You are now ready to begin tempering. Heat the bits slowly to a dull red and place them in the tank vertically resting them on the bricks with the cutting edge only under water. Leave alone until cool and your bits are tempered. The

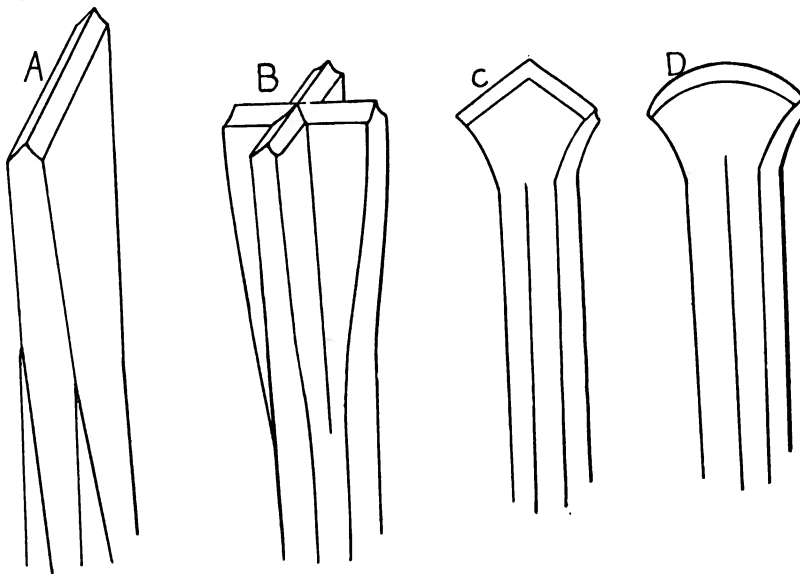


Fig. 1.—MAKING AND TEMPERING DRILL STEELS.

work with the drill runners so he can decide the forging heat, shape and how hard to temper etc. A drill properly made will increase the drilling several feet per day. Keep the cutting edges well sharpened and the sides above the edges well back to prevent drill from sticking. Have a gauge to forge the bits to, so each length will clear  $\frac{1}{8}$  inch. Then no matter what steel is brought to the shop you have a standard to go by and will thereby prevent two drill steels of different lengths being the same size.

second method requires two tubs of water; one tub to make a solution of soap suds in by shaving one or two bars of laundry soap and mixing well and the other tub for clear soft water. Now cool your bit in soft water, polish and watch the color. When a "straw color", plunge the entire piece of steel into the tub of soap suds. This allows the part of the bit that is above the cutting edges to cool slowly and thereby anneal and lessens the chance of the bit splintering or chipping. The third method is the

one used to temper a cold chisel, cooling the bit when the proper color has run down to the cutting edge. The degree of hardness can only be determined by the nature of the rock to be drilled.

The hand method of drilling is the process of churning or striking the drill steel with sledges and turning the drill after each blow is struck. The drill steels are called various local names from the shape the cutting end is forged. In the engravings, C and D will give the reader some idea of their shape. However, they are susceptible of modifications, depending altogether on the nature of the rock to be drilled. The method of tempering would be the same as tempering a cold chisel, the hardness

with it. First, in order to treat a foot with corns we must know what a corn is and where to locate it. There are several forms in which these troublesome growths manifest themselves, but they are always found in the sole of the foot and in the posterior position of the hoof, or between the bar of the foot and the wall. Hard corns are a growth on the inner sole where it joins the horny laminae. They lie beneath and at the side and rear of the foot bone. The pain and annoyance from them are caused by their crowding on the sensitive parts of the foot. The pressure of the horse's weight on the foot bone is so severe and its winged extremities are pressed down on the sensitive mem-

foreign matter taken out. The foot in all cases should be level. Make a bar shoe with plenty of frog pressure where there is pressure on heels in making bar shoe. After the bar is welded, punch a small hole in it and make a sole-leather pad exactly the size of the shoe. Punch a hole in the pad to correspond with the hole punched in the bar of the shoe and rivet the pad to the shoe. Your shoe is now ready for the foot. Now prepare the foot by cutting out the sole as much as you can, also cutting the corns out. Then pack the foot with pine tar and oakum. Remove the shoes and repack the foot every three or four weeks. I have never had a case of corns that I could not cure in this

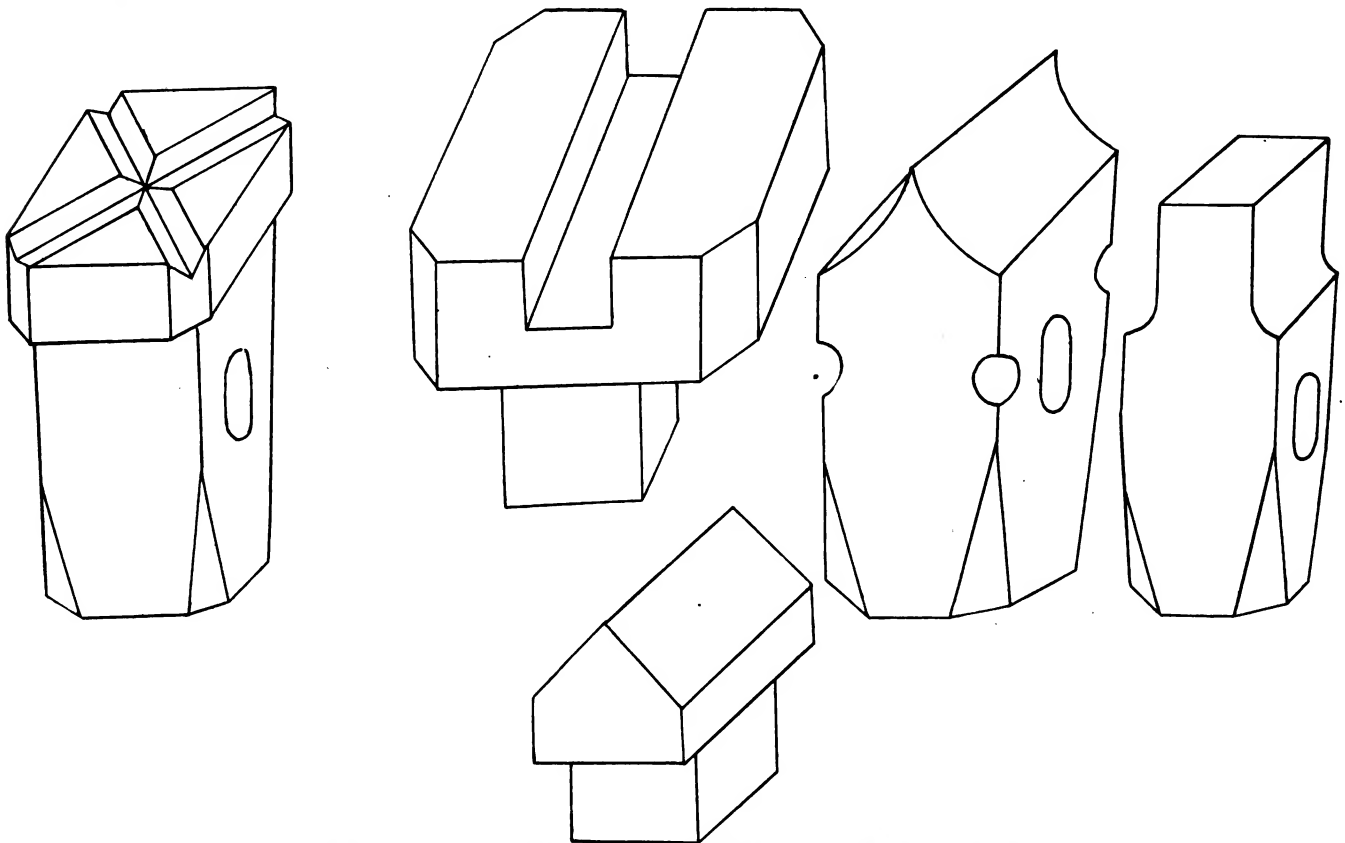


Fig. 2.—MAKING AND TEMPERING DRILL STEELS, SHOWING FORMS OF PROPER SHAPE.

depending on the nature of substance to be drilled. A special set of blacksmith tools are used to make the machine drill steels; the forms illustrated will give the reader an idea of the proper shape. If the blacksmith uses care in heating his steels to temper he will have very little trouble in getting them to stand. The danger is the smith usually overheats the bits when tempering.

#### Corns in Horses' Feet.

L. H. PINNELL.

This subject receives very little attention at the hands of the majority of shoers, and it should be carefully studied by all not thoroughly acquainted

brance and sensitive sole so forcibly as to cause a bruise. A bruise of this kind causes a sappy or wet corn, the kind most common. This kind makes itself apparent by the presence of blood. If the bloody substance is of a dark red, the corn can be readily removed, as that indicates it is growing out or coming to the surface. If it is light red it is a new corn and needs attention at once. If not properly attended to at once it may result in a goitre.

In preparing the foot for the shoe utmost care should be taken, and if the horn shows any moisture caused by the corn, it should be removed and all

way. If the corns are deep and of long standing it will take some time, but this treatment will remove them. Many smiths pay no attention to corns in a horse's foot; they let them go, and in a few shoeings have a crippled horse.

When I first commenced shoeing, I thought I knew it all. A man would come to my shop and say that his horse had corns. Of course I could fix them all right, but I did not know any more what to do for them than the horse did, and, no doubt, I ruined the horse. I have worked at shoeing twelve years, am twenty-seven years old, and expect to learn a great deal more about the

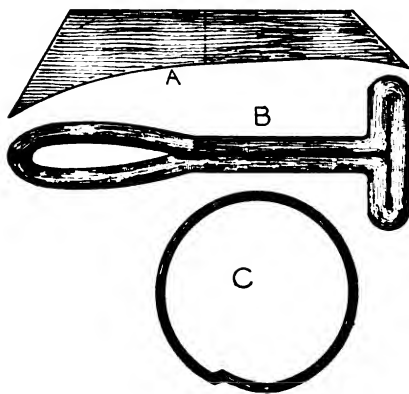


art. It is no longer a trade but a profession. I am of the opinion that the best investment the smith ever made is a few dollars invested in good literature pertaining to horseshoeing.

### Several Miscellaneous Pointers and a Few Prices.

WALTER MC'COT.

Words fail me with which to express my appreciation of the many interesting articles I see in THE AMERICAN BLACKSMITH on shop practice and tools, some of which I have used to good advantage and am thankful to the writers. I wish that I could furnish some good article in return, but having grown up from a child on these Kansas prairies, my school age passed while I drove the ox team to the prairie brakes and I find that my muscle is far better developed than language suitable for publication. And again I am a little timid from the fact that I am one of these self made fellows. I will however mention a few things in my shop



SEVERAL MISCELLANEOUS POINTERS.

practice. Being located in the wheat belt of Central Kansas, the plow is an important factor in my shop work. I point and sharpen 14 and 16-inch plow lays in from 20 to 25 minutes; weld and sharpen cultivator shovels at two heats and make new plow lays ready for drilling and polishing in 30 minutes. I use the best borax in plow work. I have sharpened 50 lays and pointed seven of them in less than a day and could have sharpened more if they had been in the shop. I have sharpened five and pointed three of them in 55 minutes. I charge 50 cents for pointing and 25 cents for sharpening. I sharpened eight 20-inch discs in 30 minutes. These were not heated but were hammered cold,  $\frac{1}{4}$  of an inch back and drawn to a cutting edge. For these I got 30 cents each. I could hammer plow discs and charge 75 cents each. This is some of my very best work and is all done under a power hammer of my own make which cost me a little

less than \$12.00. The hammer will hit 300 times a minute or it will strike but once if I should so wish. I use a 2 $\frac{1}{2}$ -H. P. Webster gasoline engine for my power and find it very simple and easy to keep in order.

I cut plow points from the end of  $\frac{1}{4}$  by 6-inch slab crucible steel and draw each end of the point to a feather edge under the power hammer. I then bend the piece in the middle as shown by dotted line in the accompanying engraving at A. After bending, slip the point over the nose of the lay and fit it down neatly, then place it deep in a clean fire for the welding heat. If the point is properly fitted you will need no tongs or rivet to hold it in place and as the heat comes up weld down feather edge, both top and bottom with iron hammer. Before removing from the fire, use plenty of good borax, and you will have a nice job. I made my iron hammer from  $\frac{3}{8}$ -inch common iron rod. See B.

I cut cultivator points 3 inches wide from  $\frac{1}{4}$  by 3 $\frac{1}{2}$ -inch cutter steel and beat out the corners to a thin edge, so as to spread it nearly the width of the shovel. I then grip on the back of the shovel point with tongs, and take a welding heat the full length of one edge. Weld the other edge as in the first heat, then trim and bring to a cutting edge after trimming. With a little practice you can do this very easily under the power hammer. I use the Edwards lever shears which I consider very useful.

I have a fan which affords me a great deal of comfort in hot weather. I made it of No. 26 galvanized sheet iron. It is 16 inches in diameter with four wings and runs about 1200 revolutions per minute, furnishing me a cooling breeze while working at the forge or power hammer. I use an old disk shaft from a McCormick twine binder, fastening the fan on by means of the two screws which hold the knife and using a 1 $\frac{1}{2}$  by 2 inch pulley and run it in single boxing. It is a bit noisy but I am going to make some ball bearings for it in the hope of running it with less noise.

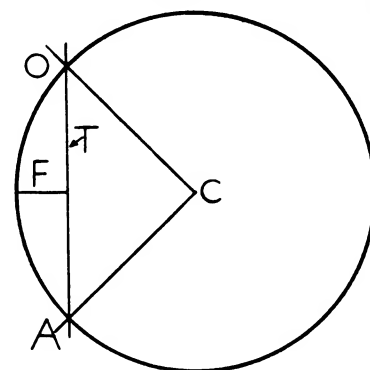
I weld buggy and wagon tires at one heat and prefer cutting and welding tires rather than take two hitches at the shrinker. I can do the job quicker and do not chamfer the ends of the tire. I use Climax Welding Compound in welding tires. I also weld and finish buggy and spring wagon stubs at one heat. I weld all heavy shafting under my power hammer and seldom have to take second heat. In welding tires I make the lap about equal to the thickness of the tire,

placing the long corners together as shown at C, and keeping the lower lap next to me so that the ends will not drop apart when lifting the tire from the fire.

### A Rule For Determining the Circumference of Bands.

Y. T. PHILLIP.

This is a simple way of determining the circumference of a band or hoop large or small. As an example we will take a 12-inch band. Open the compass six inches and scribe a circle. Now place the corner of a steel square at the center C of the circle and draw a line at each side of the square from the center to the circumference of the circle. These lines O and A will be at right



TO FIND THE CIRCUMFERENCE OF BANDS.

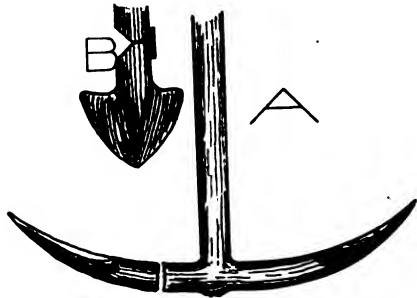
angles to each other. Now connect the two points, where these lines intersect the circle, with a third straight line T and draw a fourth line F from the highest point of this quarter circle to the center of the third line T. The circumference is now found by multiplying the diameter of the circle by three and adding the length of the fourth or F line. I have used this rule for years, as there is no time lost and no mistakes liable to be made as in figuring.

### How to Repair an Anchor.

G. H.

Very often there comes into the ship-smith shop, an anchor, with the palm broken off as shown in the engraving at A. Sometimes the old palm is recovered and brought to the shop to be welded on in its old place and sometimes a new palm has to be made. In either case the job of welding on the palm is the job we will consider here. The break is usually pretty even but if not, just trim it a little with the chisel and after fitting a good pair of tongs to the palm and swinging the anchor in the crane, (this applies only to heavy anchors 500 pounds and up) put both ends of the break in the fire and heat them up. Have a piece of iron 4 inches by 1 inch or any old piece

of metal about that size heated in another fire. When ready bring them all out and place the anchor and palm together and weld the flat piece across the break. The idea is to hold the two



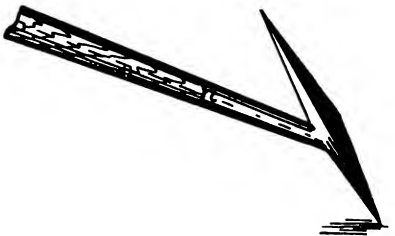
HOW TO REPAIR AN ANCHOR.

pieces together and save lap-scarfing or rigging. Now turn the anchor over and cut out a V piece as shown at B. As you now have the anchor balanced, the palm being on, it will be more easily handled and turned. Now place the anchor in a clean fire (not a hollow fire) get a good heat, fill in with the V piece and finish off that side. Then turn your piece over, cut away the flat piece and cut a V into this side. You now proceed the same as on the other side, heating the part where V was cut, placing a wedge in and welding and finishing. You will have a good job by this method if the heats are right.

#### How to Make an Ice Hook.

O. A. PARKER.

The smith is often called upon to make certain tools and implements for his farmer customers and it is always advantageous for him to know the proper shape and method to make these things, the farmer generally knowing what he wants but seldom knows the best shape and method of



A CONVENIENT ICE-HOOK.

making. For instance, a customer came to the shop several days ago and wanted an ice-hook, for the convenient handling of ice, both in the pond and at the ice-house. He said nothing as to shape and, of course, I had to scheme out what would be best for his purpose. The accompanying engraving shows the shape of the hook as I made it, and it pleased my customer so well that I give it for the benefit of the craft. The stock

used was horse-shoe bar. The handle of the hook is of stout wood and is firmly fastened with a long rivet into the socket. The spikes at the end of the hook are sharply pointed and slant in opposite directions—one for pushing and one for pulling the pieces of ice. The points are simply chilled after being sharpened and I am quite sure this tool will meet all its requirements.

#### A Home-Made Tire Bolt Wrench.

L. O. SHINN.

This tool is one which I made myself and it gives such good satisfaction that I think the brother craftsmen will be glad to hear about it. One fault with it however, is that it can not be used on bolts that turn. But as I find very few of these this is not a serious matter.

To make the tool, take a piece of  $\frac{1}{2}$ -inch pipe about five inches long and make it to fit the nut of the bolt. Then take a piece of round stock of a suitable size and long enough to reach across the wheel and weld it to the piece of pipe. At the other end of the rod weld a small piece of stock and shape it so as to fit a common brace. A hole is now made in the piece of pipe as shown at A in the engraving. This is to allow the nuts to drop out of the wrench. If, however, anyone saves the old tire bolts this hole can be plugged and the nuts taken out when all bolts have been removed.

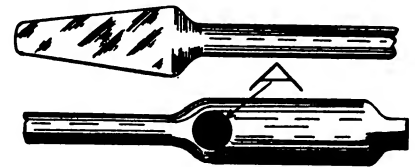
#### The French Plate Shoe.

HORACE D. HOVIS.

I have been engaged in the blacksmith business 40 years and have not got rich yet, but still I have no reason to complain of black-smithing as a trade. If I had to live my life over again I would surely choose the good old craft as my life work for the comfort of the thing as well as profit.

In looking over my many copies of the American Blacksmith, I have not seen among all of the different drawings of horseshoes anything like a shoe that I make, and have used for some years, therefore I will give it to my brother smiths. It is called the "French Plate Shoe" and the original pattern, I believe, was brought from France. It is very similar to the bar shoe, but differs from it, in that the plate or bar is made separately and welded in. Another difference is you take a common blank shoe, the size the horse wears, and cut off just what would be turned up for heel calks. The plate is then welded in after scarfing both shoe and plate. I admit that it is difficult to make this shoe, but the benefit to the horse and his owner and

also to the shoer, will more than pay for all extra work. The accompanying engraving shows one of these shoes finished and also the plate before welding. My price for these shoes is 75 cents each or \$1.50 per pair. They are used mostly on the front feet of the horse. This shoe is the best remedy for flat feet, corns, quarter cracks and similar ailments, that I know of, not excepting any of the rubber pads now in use. I claim that this shoe is the most natural



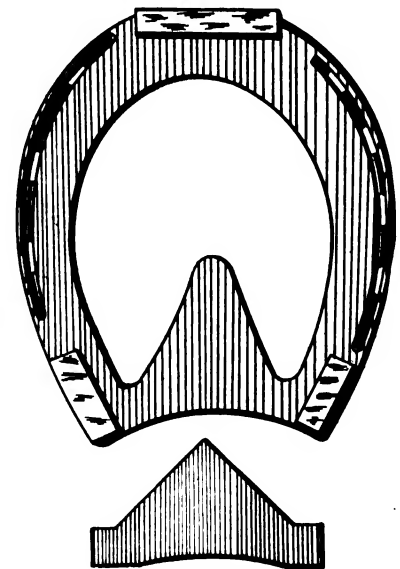
A HOME-MADE TIRE BOLT WRENCH.

shape of any shoe yet devised for work on asphalt and stone pavements. I also claim that a horse will last from 3 to 5 years longer and consequently be of that much additional value to the owner, if shod with this shoe.

#### The Shoe Should be Fitted to the Hoof.

E. W. PERRIN.

After all that has been written on this phrase of horse-shoeing and the emphasis placed upon it in the magazines and text books, it is surprising to note the extent to which hoofs are fitted



THE FRENCH PLATE SHOE.

to the shoes. It simply shows that the average shoer does not pay any attention to the anatomy and physiology of the foot upon which he works. During the past six weeks, three cases of foot lameness have come to my shop, with pricks in shoeing resulting from this practice of rasping the wall of the foot so as to fit the shoe.

There is no excuse for rasping the

outer wall of the hoof. If the profile of the hoof is irregular, see Fig. 1. the time to reduce it to its proper dimensions is before the shoe is fitted and not after it is nailed on.

Pricking the feet is not the only danger resulting from fitting the hoof to the shoe for when you rasp the outer wall you destroy the coronary frog band which covers the outer surface and im-

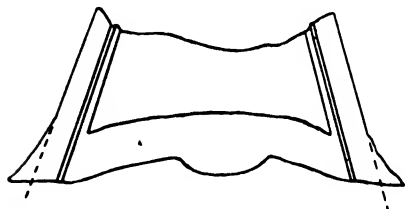


Fig. 1.—SHOWING FOOT WITH IRREGULAR PROFILE

parts to the wall that glossy appearance of a healthy hoof. Much of the rasping of the outer wall is also the result of not knowing how to properly prepare the hoof for the shoe. Some shoers think that because a horse has a long toe it must be shortened in front, but this is not so where the profile of the hoof is regular, see fig. 2. The right way to reduce a long toe, is shown by line A, A in fig. 2. In shortening the hoof by the line B B it is not reduced to its normal dimensions, but the wall is seriously damaged, while by reducing the hoof by line A A the natural dimensions are restored and the wall is intact.

Many shoers think that a little rasping of the outer wall does not do any

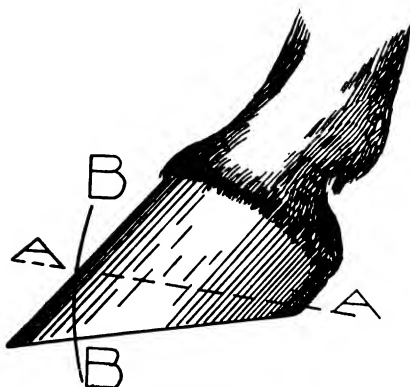


Fig. 2.—SHOWING CORRECT AND INCORRECT METHOD OF REDUCING LONG TOE.

harm, but the trouble is that this little is repeated at each shoeing and when you remember that the thickness of the wall in a good healthy hoof is but one half inch, you readily see that you take off but one eighth of an inch at each shoeing in four months (four shoeings) you will have rasped the wall to the quick—sensitive laminae. This would be the actual result if it were not for the fact that nature is constantly growing the hoof—replenishing what you rasp away. I have seen many feet so re-

duced in thickness by constant rasping that it was almost impossible to drive a nail that would hold and yet not prick the feet.

If there are any irregularities in the profile of the hoof, reduce them when you prepare the hoof for the shoe, then fit the shoe accurately to the hoof. You will find it pays, for the horse owner does not want his horses' hoofs, fitted to the shoes. But the trouble is, the practice of rasping the outer wall is so general that he may not know where to take his horse, so you had better advertise that you fit the shoes to the hoof and you'll surely get the business of the horseman who values a good job.

### Shoeing for Club Foot.

M. KEPLINGER.

The accompanying engraving shows my style of shoe for a horse that shows a tendency of getting a club foot. The shoe consists of an ordinary bar shoe with a bow welded on and running from the toe to the middle of the bar. The bow should be well curved as shown in the side view. This shoe is put on the sound foot so as to compel the horse to step upon the diseased foot.

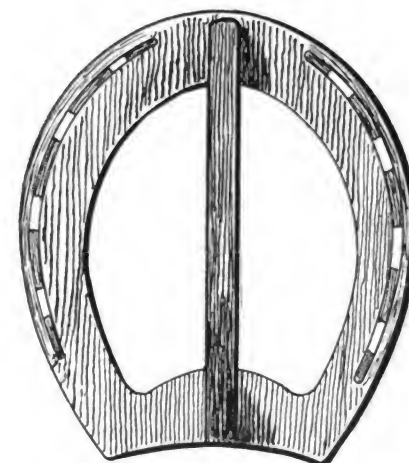
Some shoers advise a hook-toe shoe and a slanting stall-floor for the cure of club foot. But I don't think this correct as the horse must be tied short and this allows him very little freedom. My method allows the animal to move freely and he may even be allowed to run in a pasture.

### The Story of Iron Ore.—1.

Three-fourths of all the pig iron produced in the United States is made of Lake Superior ore. The industrial supremacy of the United States in the manufacture of iron and steel, the output of which will probably exceed during the present year the combined outputs of Great Britain, Germany and France, is due entirely to the purity, abundance and cheapness of transportation of the ores of the Lake Superior country, says a writer in American Industries. The premier position which the United States now holds rests upon a very firm basis, for not for many years will these deposits be exhausted; nor, indeed, could they be sensibly affected in values were equally enormous deposits discovered elsewhere, since in journeying to the furnaces they travel along a highway whose economy of transportation is not equaled anywhere.

So enormous has the ore trade of the Lake Superior country grown that it seems incredible that it should be a matter of the past 50 years merely. Yet

50 years ago the rapids of St. Mary's river acted as an insuperable barrier to commerce with Lake Superior. This great ore trade is now handled with such ridiculous ease and with equipment in the shape of ships and docks that can readily adapt itself to fluctuations from one to five million tons per month, that a truthful recital of the time when an annual stock pile of 1000 tons at upper lake ports was considered a goodly



SHOEING FOR CLUB FOOT.

amount becomes extremely interesting.

Peter White, now the leading citizen of the upper peninsula of Michigan, assisted, as a boy, in stripping the first iron mine. He wrote the bill of lading of one of the earliest, if not the first shipment of ore—only six barrels—and although nearly 60 years have gone by since then he is still active in this great iron region.

Iron ore was first discovered in the upper peninsula of Michigan by Mr. William A. Burt, United States deputy surveyor, who was engaged in surveying the upper peninsula. Burt was the inventor of the solar compass and the presence of the mineral deposits was discovered by the violent fluctuations of the needle. Mr. Burt was greatly excited by these fluctuations and com-

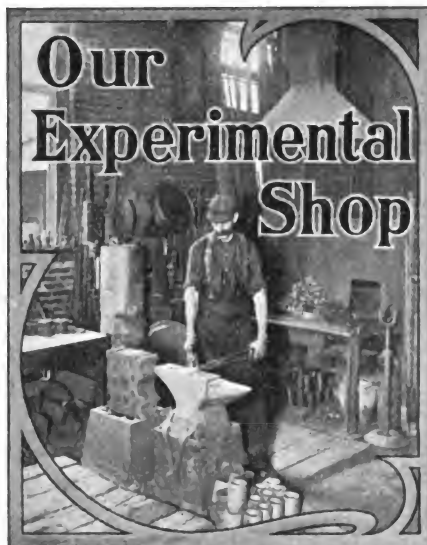
manded the members of his party to search about to see what they could discover. They had no trouble whatever in discovering ore, for a mere rip of the sod revealed the mineral. The surveyors appeared to have made no effort to profit by their discovery, merely recording the findings in their field notes. They mentioned the existence of iron to Louis Nolan, a half-breed, living at Sault Ste. Marie, Mich., and an Indian chief, Madjigijig, whose wigwam was at the mouth of the Carp river. A year or two prior to this time the upper peninsula was literally over-run with prospectors searching for copper and other precious metals. No one had hitherto heard of iron in this locality.

The pioneers of the iron mines were all possessed of the idea that the peninsula was the logical place for making pig iron. They all attempted it, but the obstacles against its successful manufacture were insuperable. One of the causes was the impossibility of keeping a sufficient stock of charcoal on hand to keep the forge running. The charcoal in those days was all burned or charred in pits. Such a thing as a charcoal kiln of brick or stone was unknown. Then again, the hauling to the shore of the lake was expensive, and the unloading at the Sault for portage over the rapids was also expensive. By the time the bloom iron reached Pittsburg it cost \$200 per ton to make, while the market price for iron at that time was \$70 per ton. It began to dawn on the pioneers that the real business of the peninsula was the shipping of the ore itself to the lower lakes. This operation was also attended with great difficulty. Nothing but an Indian trail extended from the shore of the lake to the mine. The rude wagon road which had been hewn through the forest would not support so weighty a substance as ore in the summer time. The summer time was, therefore, devoted to mining the ore, and the winter to hauling it in sleighs to the shore of the lake.

The sleighs held about a ton each. It was impossible for a team to make more than one trip a day. The records of the Cleveland Iron Mining Company show that eighteen tons were hauled one day, which, added the agent, "is the biggest day yet." If by springtime a stock pile of 1000 tons had accumulated it was accounted a large amount.

In 1852 the iron companies began the construction of a plank road to the mines. It was at this time that Peter White wrote the bill of lading.

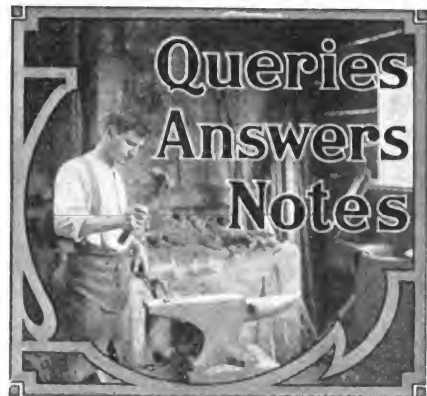
(To be Continued.)



Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

An excellent paint for protecting exposed steel plates is made as follows: Grind four pounds of pure lamp-black in raw linseed oil; add to this seven-eighths gallon genuine asphaltic varnish, one-quarter gallon pure refined linseed oil and one-quarter gallon drying japan. One gallon of this paint will cover about 40 square yards.

An oil that will not become stiff in cold weather is valuable to those operating machinery outside or in cold shops. A good formula by a western smith is as follows: Mix sufficient cylinder oil and graphite to make a thick paste and then thin with kerosene oil until the mixture flows freely. This oil is not affected by cold down to ten degrees below zero.



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**Welding Channel Tires.**—Will some brother smith tell me how to weld channel tires? I get a few to put on and want to know the best method. JOHN P. FAULSTICK.

**Removing Old Paint.**—In reply to Brother Husser who wants to remove old paint from buggies, will say, get some Lightning Paint Remover from the W. J. Holloway Company of Indianapolis, Ind. M. T. D.

**A Question on Corns.**—I would like to hear from some brother about corns which

have broken out on the top of the foot. Is there any cure or relief for it? If so, I would like to hear from the brother blacksmiths on this matter. L. GANELLS.

**Regarding Cold Setters.**—I am thinking of getting a cold tire setter and would like very much for some brother to tell me which is the best. J. F. WILLIAMSON.

**Scarfig and Welding Channels.**—What is the best way to scarf and weld steel channels for rubber tires? I am going to install a plant next spring and will be very much pleased to hear anything on this point from brother smiths. A. S. MACDONALD.

**Shoeing Wire Cut Feet.**—Will some reader of the AMERICAN BLACKSMITH please tell me how to shoe a horse which has cut its feet on wire? There is about half the hoof the shoe should not bear on. I will be very much pleased if they tell me how to shoe this horse. PROCOPIUS JELEN.

**Questions on Drilling.**—In drilling wells here, I find the rock sets slanting and I have to drill and drive casing 75 to 100 feet deep before I get to rock, and the end of my casing won't shut off the cave. What is the best way to overcome that? I drill the hardest kind of rock, known to well drillers so will some one tell me the best way to heat my drills and also dress and temper them? We have soft water. W. L. SPANGLER.

**The American Blacksmith Again Receiving Credit.**—I scarcely know how I ever got along without the AMERICAN BLACKSMITH I have as yet only received three copies and can say I have been fully repaid for each copy. I cannot see how any progressive smith can get along without it and I intend to be a constant reader. It is always full of instructive and interesting matter and fills a long felt want. I wish it were a weekly journal even if it would cost \$4.00 a year. JAS. N. VEVILLS.

**Uses Dividers on Tires.**—For setting tires I use the dividers for I find I can do the work better and much quicker. To make the dividers to use on tires, I took an old manure fork, cut two tines out and spread the other two so the points are about one foot apart. Then punch a hole through the tang so I can hang it up on the forge or the anvil block. I would like to ask the brother smiths about cold tire setting. I have not had any experience with the cold tire setting machines, but I have always doubted the work especially on old wheels. H. KRATIMER.

**A Letter from West Virginia.**—I think THE AMERICAN BLACKSMITH is something fine. I cannot do without it at all. I am 53 years old, have worked at the trade since 14 years of age and have never taken any blacksmith paper until your paper came. My principle work is horseshoeing. I have a fine trade, do some wagon work and nearly all kinds of farm implement work. I keep my shop clean and I think if there is anything that looks mean it is a filthy shop. I cannot see how some men work in the dirt. I should think it would be impossible to do good work. GEO. UNDERWOOD.

**During Spare Time.**—I will tell my brother smiths what I do when not busy in my shop. I clean and repair watches and clocks and sewing machines, but I am very



busy now with wagons, buggies and mowing machines. I have a Chicago Gasoline Engine of five horse power. I have a 24-inch plane to do my dressing, also have a rip saw and am now fixing to enlarge my shop. It is now 18 by 40 feet, but I shall add 16 by 24 feet as soon as I can get time. I do all my own work. I make my own dies and anything else that I want and the AMERICAN BLACKSMITH is a great help to me in my work.

NOAH G. SLOAN.

One of very many.—I send you a dollar to renew my subscription to your paper, which I know is one of the best that I have ever seen.

I love the AMERICAN BLACKSMITH and want to do all I can to keep it a good journal for the benefit of all blacksmiths. I am running a shop now by myself and am getting all the work I can do. I have gained in horse-shoeing as much as any one branch of the business and have learned quite a number of things from your paper. I keep every number of it so I can refer to anything I want. I want to keep in touch with everything new. That is why I get as much work as I do.

W. E. MARKES.

Shoeing The Horse With Bad Feet—I see another of our brothers in trouble about a horse's bad foot. May be I can help him as I am working on a horse exactly like brother F. S. described in the October issue. Trim the toe of this animal's foot as low as possible and get the heaviest shoe you can find. Make long calks at the heel and place the shoe on the foot so you can rasp off  $\frac{3}{4}$  of an inch from the toe and I think you will have a satisfactory job. The horse will be all right after three shoeings of this kind. Then you can make the heels on the shoe smaller, as the heels grow out on the horse. This horse of mine is carrying mail every other day, 28 miles over the roughest roads in Georgia, with ease now. Try this and let me hear from you on the matter, brother F. S. EUGENE MIDDLEBROOKS.

Repairing the Cylinder Jacket.—In regard to the question asked by Walter McCoy in the October AMERICAN BLACKSMITH as to how to mend the jacket on a gasoline engine, will say that I have had the same experience. I mend them with solder. First, scrape the paint off around the cracks and then file until thoroughly bright. Now put the engine in such a position so the crack will be on top. Then heat a piece of iron in the forge and lay it on the part to be mended and leave it there until the jacket becomes hot. Have ready some muriatic acid with as much zinc in it as the acid will cut and apply this on parts to be soldered. Now, take a good hot soldering iron and bar of solder and tin the parts well. Then load the cracks heavily with solder. Old tinner's have told me it could not be done, but if you follow directions above, you will meet with good results. I have two jackets in my shop that I have repaired and one of them I have used a year since repairing it.

ELLWOOD WILLIAMS.

An Interesting Item From Kansas.—I could not do without the AMERICAN BLACKSMITH. I think it has helped me in my work to make my shop the cleanest, neatest and best shop in the country. I have a Witte gasoline engine of 3 H. P. and run an emery wheel and polisher, a drill, a lathe, a grind-

stone, a spoke tennon, a power blower, a pump, a fan and also trip hammer. When I first began taking the AMERICAN BLACKSMITH I did all my work alone and by hand. Then I hired a man and then bought machinery and now three men and myself are busy most of the time, and my shop is spoken of all over the country, as I keep well advertised. I firmly believe in advertising and during fair week, I distributed some very catchy cards besides taking a half page in the daily newspaper during the week. I say advertising pays very well.

I am thankful I can get such a good trade paper as THE AMERICAN BLACKSMITH for one dollar a year and I wish you success and long life.

W. R. JONES.

Some Illinois Prices.—As I am sending in to renew my subscription, I will also give you some of my Illinois Prices.

Sharpening Discs.....	\$2.00
Rolling Coulters.....	.25
Plows 12 and 14.....	.25
Plows 16 inches.....	.30
Pointing Plows.....	.50
Cultivator Shovels sharpening, per set	.40
Saw Gumming, two man saw.....	1.00
Cut-off saw.....	3.00
Filing saw Cross-Cut.....	.30
Hand Saws.....	.25
Filling Wagon Wheels, each.....	3.00
Wagon Tongues each.....	2.50
Bolsters, hind.....	2.00
Bolsters, front.....	1.50
Setting Tires per set.....	2.00
Machine Work per hour.....	.40
Main Springs for guns from .50 to \$1.00	
Revolver Main Springs.....	.25

I wish to say to the brother smiths that I hope to see the time, when we can get laws to make those bad debts of ours, good, and I believe if we all join hands we can have it that way. The AMERICAN BLACKSMITH is our best friend and why not try to make it better?

WILLIS JOHNSON.

Prices From Iowa.—We have a two-story shop 24 by 40 feet. Have a four horse Fairbanks-Morse Gasoline Engine and it is a dandy. We run a disc sharpener, an emery stand and a circle saw at present. We have just bought a Hawkeye No. 2 trip hammer and a power drill and expect to add more machinery in the near future. We believe in labor saving machinery. The following are some of the prices we get for our work.

New shoes each.....	\$ .40
Steel plug shoes each.....	.50
Never-slip shoes each.....	.65
Setting old shoes each.....	.20
Sharpen, polish and harden lays... ..	.50
New lay 14 inch.....	4.00
" " 16 ".....	4.50
" " 18 ".....	5.00
Point plow lays.....	1.00
Point 4 shovels.....	2.00
Sharpen 4 ".....	1.00
New wagon tongue (put in).....	2.50
Wagon axle.....	3.00
Wagon bolster.....	1.50
Set wagon tires, each.....	.50
Setting buggy tires, each.....	.65

Our prices for other work are in proportion to the above. P. M. DAMM & SON.

Another Tool for Applying Axle Clips.—I noticed in the September issue an article and an illustration by Parker Clark, of a tool for applying axle clips. This kink we used in the shop several years ago, only the tool was made differently and was much handier. Take a piece of 7-16 inch round

steel (a horse rake tooth for example) and draw one end of it down to about  $\frac{1}{8}$  of an inch. Now bend one end at right angles and leave it about  $\frac{3}{4}$  of an inch long. Now measure the entire piece and cut off all but 14 inches. Then draw down the straight end to a chisel shape and thin. Cut a scallop in the end to fit about  $\frac{1}{4}$  the way round the clip. This done, bend in a U shape at nearly the middle, leaving the bent end just the thickness of the nut longer than the other end. By filing the thin end so it will go to the bottom of the threads, the tool is ready for use, and is used the same way as brother Clark uses the tongs. See illustration for shape of tool.

I also notice in the October issue an article entitled "Working Angle and Channel Irons". The welding of these two forms is comparatively easy, but will brother Bacon or some other brother who knows, kindly tell us how to scarf T and I so they can be welded.

A. E. FREEMAN.

A Letter From the Blue Grass State.—

I have been a reader for sometime and enjoy reading the letters of the craft from the several states, but have so far failed to see any letter from Kentucky. This state is very much like all the rest, it too has it's price cutters. I have been located in Pembroke for 6 years and am doing quite a nice business. There were four shops when I came here, but there are only two now and the other one employs only one smith, while I work three men besides myself. I have a shop 40 by 56 and do all kinds of general repairing. I make horseshoeing a speciality, do all the shoeing myself and shoe some very fine horses. I get one dollar for plain shoes and from two to four dollars for fancy shoeing, according to the speed, style, action of the horse and the kind of shoe used. My shop is fully equipped with the best tools. I don't think any smith can do the best work with poor tools.

In reply to Mr. Pemberton's query on interfering in front, he failed to state whether or not the same shoer shod him last, that had been shoeing him. If the same shoer has always done the work and the horse never interfered before, it must be due to some fault of the horse's limb or foot. Try a shoe like this; forge the inside one half-inch thick and the same width, leaving the outside  $\frac{1}{4}$  of an inch thick and one inch in width. Now trim the foot perfectly level and drive the shoe on, being careful to level the foot. If this does not stop him, there must be something wrong with the leg or shoulder. MACK HARPER.

An Interesting Talk From Missouri.—Being a reader and admirer of THE AMERICAN BLACKSMITH, I write you the following few lines. I have been in business for three years, and am still where I first located. With two exceptions I have every customer that I had when I started and am gaining trade all the time. I am a smith who some claim never learned the trade, yet I have never fallen down on a job or asked anyone to help me out except when I had more work on hand than one man could do.

As to whether I ever learned my trade. I will let the brothers decide for themselves. In the season of 1895 I bought a well drilling outfit and the first day that it was in use I was out 75 cents for bolts and other

small articles from the blacksmith. That put me to studying, so I hired a smith and gave him \$1.50 a day and board and kept him ten months. I then let him go and did the work myself for four years before I began to work for the public. I see trade journal articles quite often that make me wonder if the author ever saw a well drill. Another class that is amusing to me are some of the journeymen or what are called transient smiths. I have had them come in my place, look all over the shop, and then ask why I don't do things this way or that, have this tool or that, charge this or that price, without even knowing what my trade demands. Doubtless some of them never ran a shop a day on their own responsibility.

To brother smiths I would say this for the sake of the craft. Keep clean, don't drink, use good material, charge a reasonable price and you will win. P. R. POLLEY.

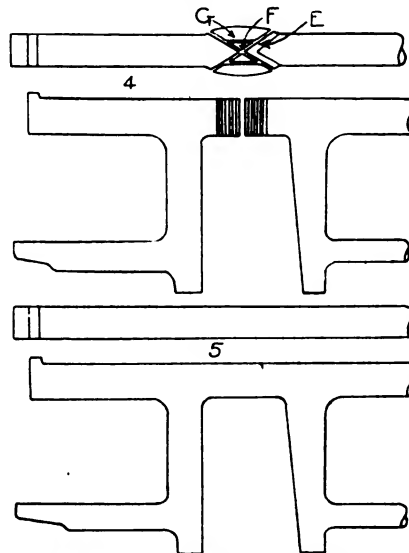
**A Letter From Indian Territory.**—I enclose post-office order for which extend my subscription to the AMERICAN BLACKSMITH for three years. It is the best friend that ever visited the home of the blacksmith. I am always anxious to read the writing of other smiths, as they are a great help to me, and I owe my success to this journal. When I subscribed 18 months ago, I was running a shop 20 by 40 feet, doing my work all alone without power. To-day, I employ a helper, the shop is 40 by 40 feet and I own a No. 2 Racine Gas Engine, a wood lathe, a band saw, a press drill, an emery stand, a blower, a trip hammer and have all the work we can do. I am young in the craft, having worked but six years at the trade.

I received a job last week that I would not have undertaken 12 months ago or even now had I not kept posted by reading. It was to weld a stem to a Z well drill, 2½-inch shaft. I split one end and drew down the other, coaked up a nice lot of coal, put the stem together and placed the pieces in fire and took a good heat. When it was about to a welding heat, I applied borax and when the piece was hot enough I placed

drive a nail in a horses foot and make the nail come out below the hair is called a horseshoer. I have very good success with anything I undertake and as a smith in this country has a wide range of work he has a little of everything in the line of repair work. I wish my brother smiths and the journal all success and thank them for their fine articles. C. S. BLISS.

#### Making and Repairing Locomotive Frames.\*

Evidently the steel frame will be the frame for the future, for the reason that it can be produced much cheaper than wrought iron forged frames. Future developments may bring this metal to such a standard that it will resist the strain to which it is subjected as well as the forged



Figs. 4 and 5.—MAKING AND REPAIRING LOCOMOTIVE FRAMES.

iron frame. From my point of view and the many failures that have come to my notice, in the past two years, it has not yet reached the standard that the wrought iron frame has. Many of the steel frames break at the intersection of the pedestal to the back bone of the frame where the main driving axle is located. As this failure often takes place with our largest engine frames, it is evident that the severest strain is located at this point, consequently it cannot be expected that an ordinary weld at this point will be stronger than the original material. When a broken steel frame is placed in the blacksmith shop the best method to strengthen this portion of the frame should be adopted, regardless of extra expense. The method adopted in the Southern Pacific Shops is to forge a new piece of the best quality of iron and cut out the defective portion; weld in a new T piece with the fiber flowing in the direction of the strain to which this portion is subjected. By this method, we have to make three welds. This may look like a round about way of repairing the fracture. The object of this is to get a sound piece of iron at the point where failures continually occur in the steel frames. The method adopted for welding the new piece into the steel frame is, first to weld a piece of iron about an inch thick, onto the ends of the frame at the proper angle to receive the V shaped piece, then the new piece is firmly fastened in place with straps bolted together. By this method, we have for our main welds, iron to iron to receive the V shaped pieces.

Recently we have been changing many of our compound locomotives to straight engines. To accomplish this, it became necessary to lengthen the front end of the steel frames as shown at G—F—E, fig. 4. The following method is used at the Sacra-

\* Report by Mr. S. Wren, read before the N. R. M. B. A. convention at Cleveland.

mento Shops to produce the new iron portion, fig. 4. First, fig. 1, C, is produced by lap welding a T piece over half the thickness required, then laying two of these T pieces together as shown in fig. 1, B. The two pieces are welded together, after being brought to the proper heat in a reverberatory furnace, under the steam hammer, producing fig. 1, C in perfect shape. The fiber flowing in the direction of the strains. Fig. 2, D is produced from solid material with a projection about five inches as shown. Fig. 2, D and fig. 1, C are now welded together, producing fig. 3. The new end is now welded on to the steel portion of frame as shown in fig. 4. When repairing the steel end of the frame for the final weld, a piece of iron is welded on about one inch thick as shown at E, fig. 4. This method leaves the two ends to be welded of the same material to receive the V shaped pieces G, and F. The V piece F is welded in the cavity for the purpose of insuring a perfect weld in the center of the bar. The V shaped G is at an angle of about 110° and when welded into the cavity under the steam hammer is almost equivalent to a lap weld. On our system, forty of these iron-to-steel frames have been in service a year and only one has come to the shop broken at the weld. I am under the impression that this break was caused by the steel frame breaking on the opposite side, as no sign of the weld presented itself in the fracture. Fig. 5, shows the end of frame completed.

Another innovation in the art of blacksmithing is the repairing of frames on the engine by the Thermit method. The first experiment in the Sacramento shops of mending a frame by this method was tried April 14, 1905 on the longest engine on the system. The frame was broken at the junction of the pedestal to the back as shown at A, fig. 6. The first preparation made, was to drill a series of ¼-inch holes through the broken section as shown at A. The holes being drilled at right angles to each other, would produce a number of small projections facing each other. About ¼ of the projections were cut out, leaving an opening ¼ of an inch between the projections. A jack-screw was placed between the pedestals to spread the crack ¼ of an inch. A wooden pattern was now made to fit the contour of the portion of the frame to be repaired, with such projections on it as are required to produce the re-inforcement desired. The projections are for the purpose of forming the cavities in the mold.

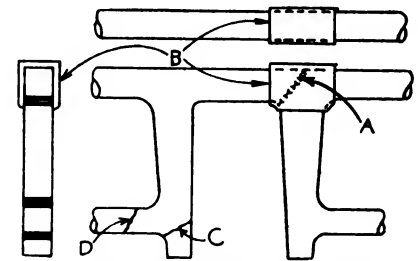
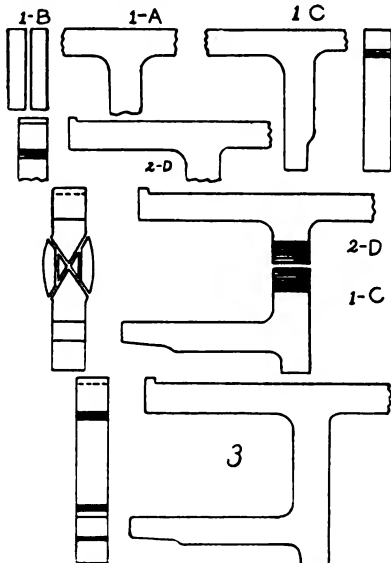


Fig. 6.—MAKING AND REPAIRING LOCOMOTIVE FRAMES.

The ends of the parts to be welded should be warmed with an oil burner. Eleven ounces of Thermit is allowed for each cubic inch of space. A collar ¼ of an inch thick as shown at B, fig. 6, was left around the broken section. The molten metal passes through the opening sufficiently hot to fill it and apparently forming a perfect union with the two ends of the bar. The frame referred to has been in service up to this date, without showing the slightest defect. Eight welds have been made since this process and not one has failed. Two welds have been made as shown in fig. 6, D and C. The only skill required is making and properly fitting the mould around the section to be repaired.



Figs. 1, 2 and 3.—MAKING AND REPAIRING LOCOMOTIVE FRAMES.

it on the anvil, the keeper holding one end and the owner of the drill the other while I did the striking. Except to smoothing up, the weld was made in one heat. This job saved the owner a trip to a machine shop and also saved him time and money.

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1/2 in., " " " " " " " " " " " "	2.30

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3/4 x 1 in., " " " " " " " " " " " "	4.90
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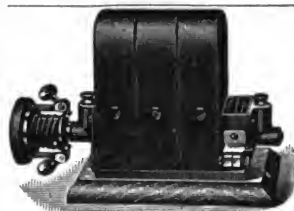
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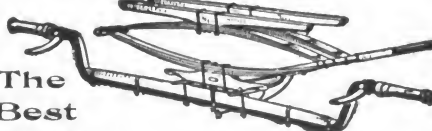
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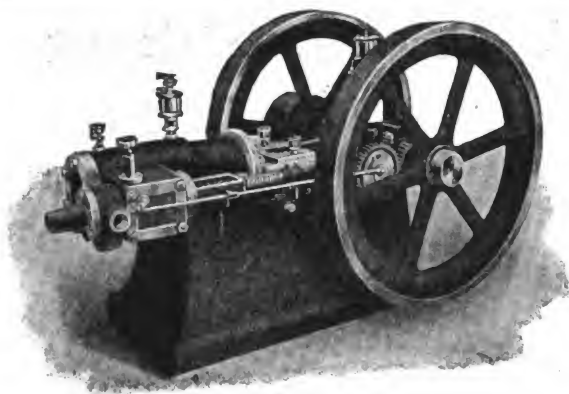
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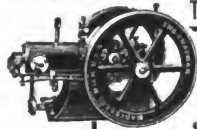
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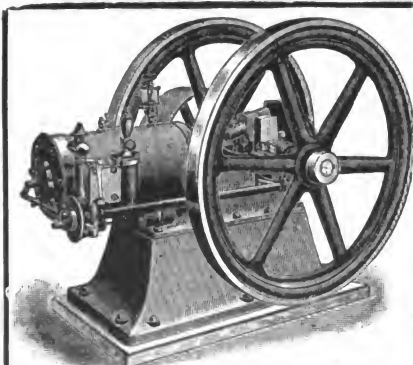
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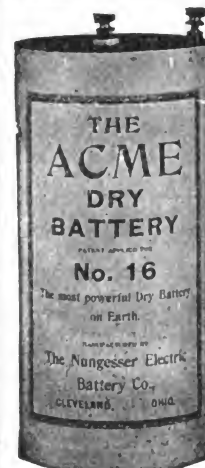
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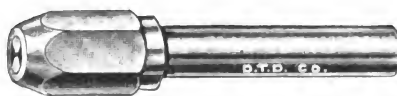
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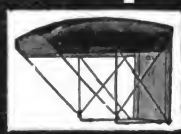
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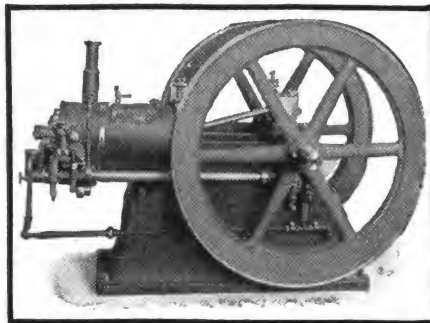


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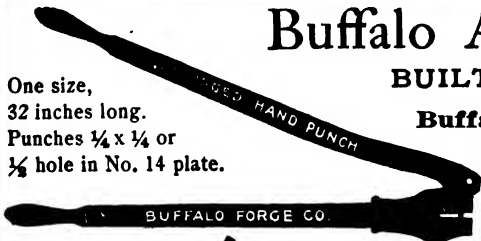
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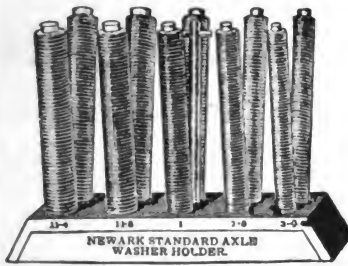
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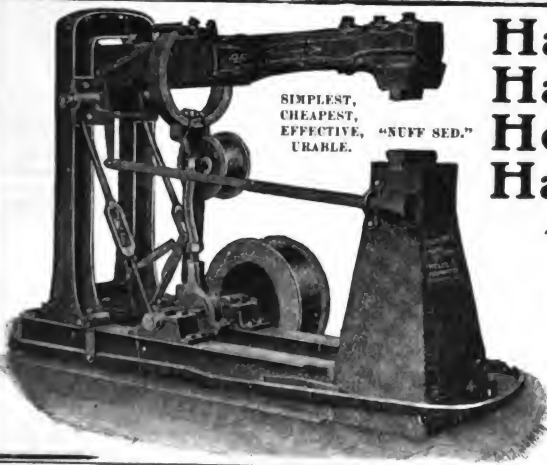
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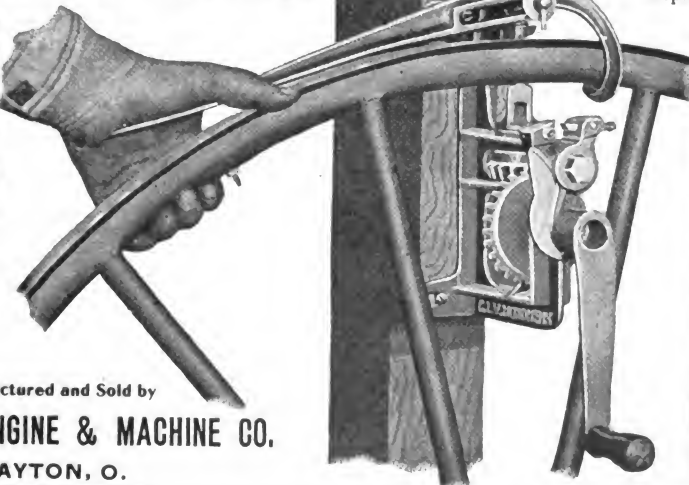
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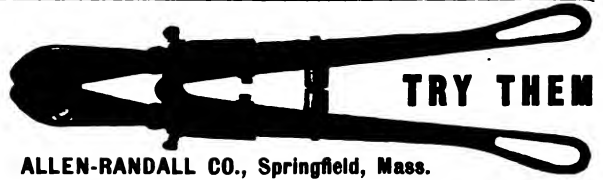
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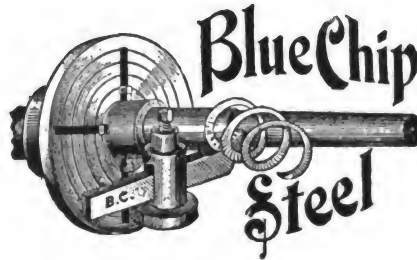
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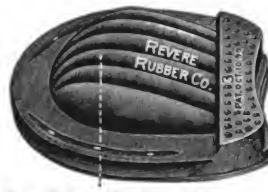


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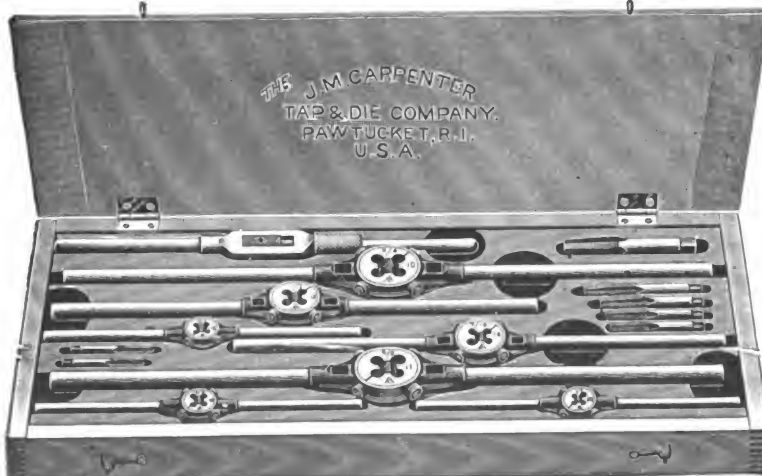
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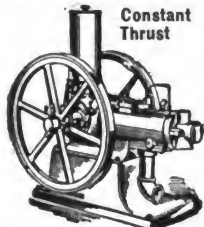
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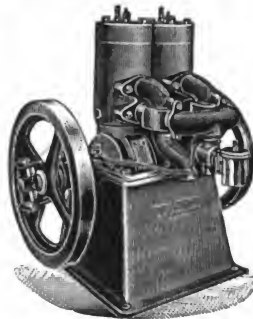


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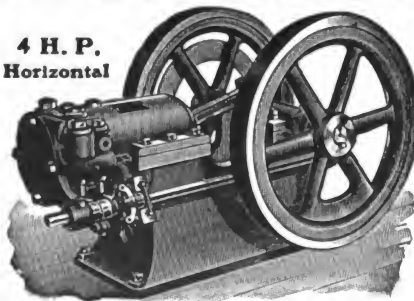
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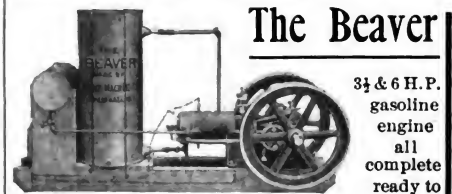
4 H. P.  
Horizontal



Also equipped with pumping attachments. Write for booklet describing full line New Era Gas Engines from 4 to 100 H. P. Special inducements to dealers as agents.

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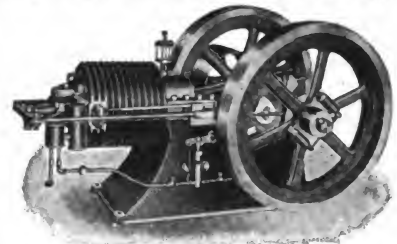
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gasoline  
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complete  
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run. Can be moved anywhere.

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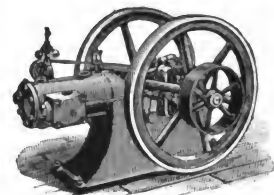
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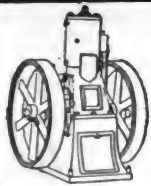


2½ H. P.  
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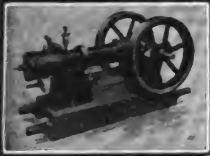
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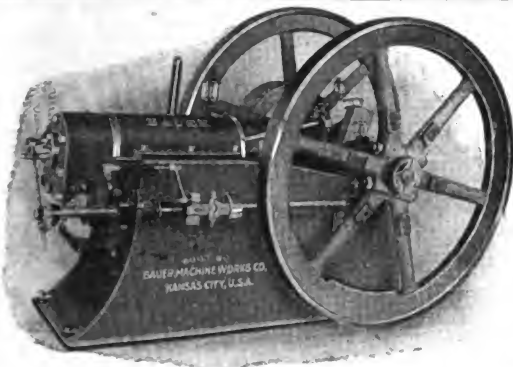


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The "ELI" Gasolene Farm Engine is the only fit engine to have on a farm, where one is a good way from the repair shop. The "ELI" is so simple that there's nothing to get out of order. It will run year in and year out without the tinkering that other engines require. It is the only engine without cams, gears, and levers. We call it "Fool-Proof" because, if some simpleton or a child should monkey with it, he couldn't make it dangerous. It is absolutely safe. Isn't that the kind of an engine YOU want? Then write for our free booklet, telling how and why it is so simple and safe.

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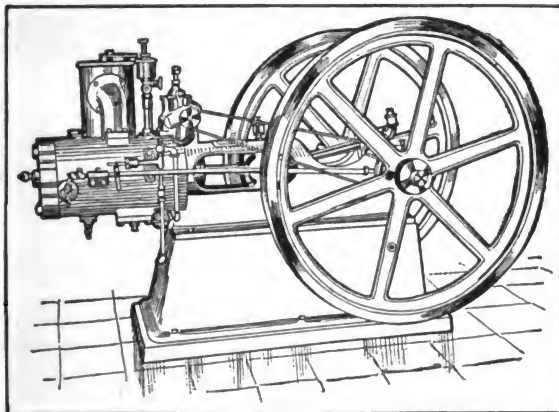
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SIMPLE, DURABLE, SAFE

Two Cycle Type. Smooth Running, Practically No Vibration.



2

— TO —

30

H. P.

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TO  
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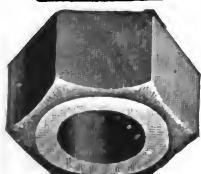
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Do you want a Screw Plate cutting  $\frac{1}{4}$  to  $\frac{3}{4}$ ? Now is a good time to buy. Send for price delivered to nearest R. R. Station. CATALOG FREE

## DON'T BUY A SCREW PLATE

—Until you know what the "REECE" IMPROVED SCREW PLATES cost and have heard our arguments in their favor. **It Pays** to look around before you buy and find out all you can about the different makes. You will find that the "REECE" SCREW PLATES have more points of **REAL MERIT** than any other kind. You will find that you always get about what you pay for. Low prices mean cheap goods. Our prices are not excessive and when you get a "REECE" SCREW PLATE you get one that will cost only a trifle more than a cheap screw plate and outwear two of them. Quality counts every time.

SOLE MANUFACTURERS  
**THE E. F. REECE CO.,**  
GREENFIELD, MASS., U. S. A.

## Cortland Welding Compound Co.

CORTLAND, N. Y.

Manufacturers of

**Climax Welding Compound,**  
**Cherry Heat Welding Compound,**  
and **BORAX-ETTE.**



**B**ORAX-ETTE makes steel weld easily. It does not have to be applied between the laps like other compounds, but is used the same as borax. It has no equal for all kinds of steel welding.

**SAMPLES FREE.**

FOR SALE BY DEALERS IN **BLACKSMITHS' SUPPLIES**



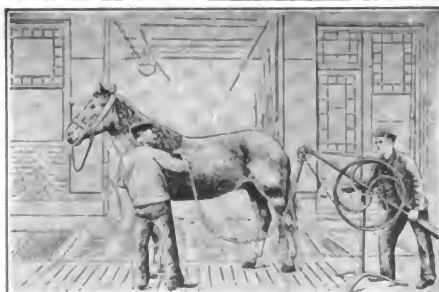
**SOLD BY LEADING  
DEALERS EVERYWHERE.**

**IT RINGS  
LIKE A BELL.**

## The Celebrated Gillette Horse Clipping Machines

The Guarantee we give you with our Machine is as good as a U. S. Gold Bond.

We are so far in advance of other Machines in improvements that we really have no competitors. Gillette Machines give satisfaction in every way.



Our claim is as broad as words can make it. The Gillette Clipping Machine is **better than any other Clipping Machine in every particular.**

The Gillette Machines were the first Horse-Clipping Machines made in any part of the world; many imitations have been put on the market, but none have ever reached our high standard.

Write us for our Catalogue.

**THE GILLETTE CLIPPING MACHINE CO.,** 114 WEST 32D STREET,  
NEW YORK, N. Y.

## THE WATERLOO BOY

Our Blacksmith's Special  
3½ to 4 H. P.

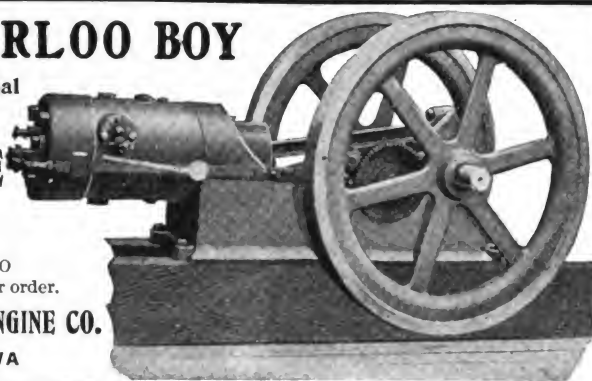
### GASOLINE ENGINE

The Engine Is Right!  
The Price Is Right!

Investigate the WATERLOO  
before placing your order.

WATERLOO GASOLINE ENGINE CO.

WATERLOO, IOWA

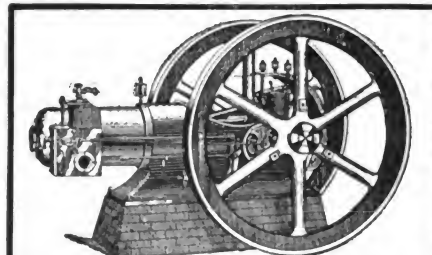


## METAL SHINGLE ROOFING . .



With Montross Telescope Side-Locks is the best roofing in the world for house or barn. Storm proof. Easily applied. Catalogue, Prices and Testimonials free for the asking.

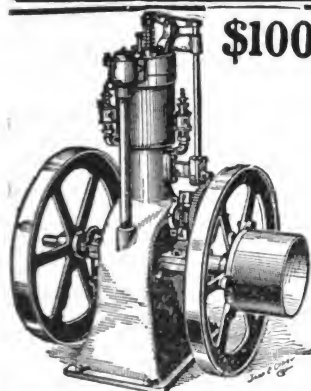
Montross Metal Shingle Co., Camden, N. J.



Why buy an experimental gas engine, when for the same money you can buy one that has stood the test for twelve years, and have the further advantage of being able to use it either with gasoline or kerosene. Built in sizes of from 2 to 100 H.P. Write for our large catalogue and prices, if interested.

### MODEL GAS ENGINE WORKS

Lock Box 2003, AUBURN, INDIANA  
New York Office, B-21 Produce Exchange.



## \$100 The New Pierce Gasoline Motor IS A WONDER.

It will develop more power on less fuel  
than any other make in the world . . .

Built on modern lines and up to the very latest practice; made from the best material, and with ordinary care will last a life-time.

We have been building Gasoline Motors for over twenty years. More than 12,000 PIERCE MOTORS are in use in all parts of the world. We know how to, and do, build them right, in fact, we

**Guarantee Them to Give Satisfaction.**  
**If they do not, send them back and we**  
**will refund your money in full. . .**

The PIERCE MOTORS are the best in the world and cost less than the poorest. We guarantee them against defective material for life. If you want power for any purpose, write for our printed matter, stating your needs. We also build other sizes up to 100 H. P., also Marine Motors, Launches and Auto Boats. Be sure and address

PIERCE ENGINE COMPANY, - Dept. 8, Racine, Wis.

3 1-2 Actual Horse Power.

## THE SINNING GAS ENGINE

Is the simplest, most durable,  
and most reliable on the market

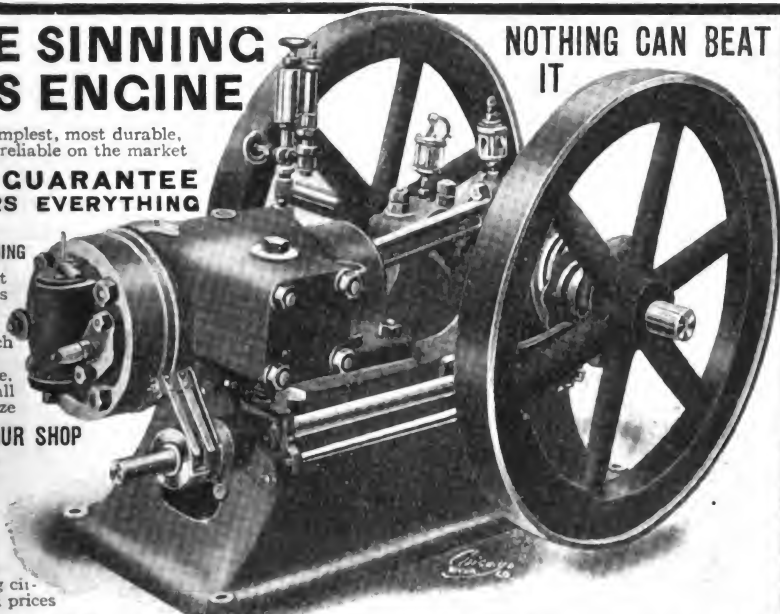
**OUR GUARANTEE**  
**COVERS EVERYTHING**

### THE SINNING

is cheapest to run, has few working parts, all of which are interchangeable. Bearings all hard bronze

**EQUIP YOUR SHOP**  
with the  
**VERY BEST**

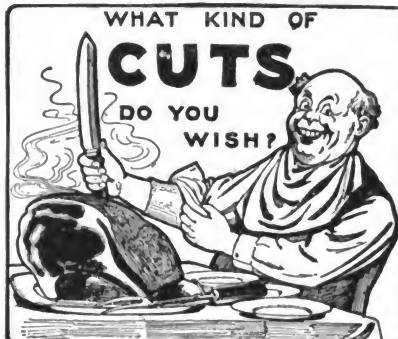
Write for  
interesting circulars and prices



THE CHARLES SINNING MACHINE WORKS

242 DICKSON STREET  
ST. LOUIS, MO.

NOTHING CAN BEAT IT



WHAT KIND OF

**CUTS**

DO YOU  
WISH?

**CUTS** for Circulars, showing exactly what is needed.

**CUTS** for Booklets, making the matter plain and interesting.

**CUTS** for Catalogs, illustrating the article clearly.

**CUTS** for Street Car Cards, attractive and attention-compelling.

**CUTS** for any purpose, and all of the highest quality.

Three-Color Half-Tones a specialty.

ASK TO SEE SAMPLES OF OUR WORK.

BUFFALO ENGRAVING COMPANY,

Cor. S. Division and Ellicott Sts.  
BUFFALO, N. Y.

## ONLY ONE TO A CUSTOMER

AT THIS SPECIAL LOW SAMPLE ORDER PRICE



**\$50.00** buys a RUBBER TIRED BUGGY. Fine Leather Top. Tires Warranted.

RUBBER TIRED RUNABOUT for only **\$40.00**  
Quality, Material and Workmanship Fully Guaranteed. At These Special Prices f.o.b. Cars, Cincinnati.



REFERENCES:—Bradstreet's or Dunn's Mercantile Agency. All inquiries promptly answered. Write for catalogue and information.

**The Hickory Carriage Company**

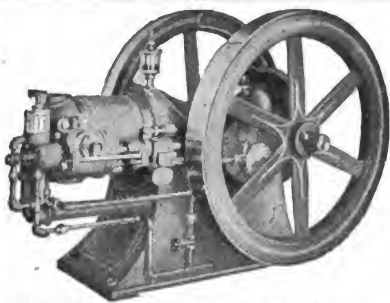
(INCORPORATED)

MAKERS OF STANDARD GOODS

SOUTH STREET

CINCINNATI, OHIO

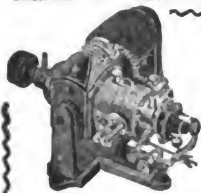




### MICHIGAN FIVE HORSE

A handy, reliable and economical gasoline engine for the blacksmith or machine shop owner. Every part fully illustrated and explained in our catalogue and every engine guaranteed. Ask for our free book, "Proof Positive," showing how the engines are used, and letters from the users. 2, 3½ and 6 Horse Power sizes for light power and farm uses.

**The Nation Engineering Co.**  
SAGINAW MICHIGAN



To Gas Engine Operators.  
Dynamo Ignition.

### Motsinger Auto-Sparker

No battery to start or run. The original speed-controlled friction-drive Dynamo. Driven parallel with engine shaft. No belts. No beveled pulley or beveled fly wheel necessary. For make and break and jump-spark system. Water and dust proof. FULLY GUARANTEED.

We have an attractive proposition for the Dealer in Gas Engine lines. Correspondence solicited. Write for 32-page catalogue, FREE.

MOTSINGER DEVICE MANUFACTURING CO.  
33 Main Street, Pendleton, Ind., U. S. A.

### New Era Electric BLOWER

Direct connected, has been designed especially for the blacksmith, and it is his ever-ready helper that works for less than five cents a day, and never tires. It places him on an equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.

NEW ERA ELECTRIC CO.

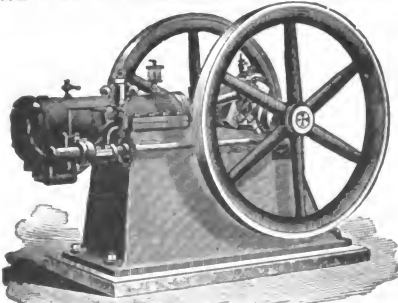
Write for circular and particulars.



942  
W. Lake St.  
CHICAGO.

### COLUMBUS GASOLINE ENGINES

ARE THE THINGS FOR BLACKSMITHS



Send for Catalogue 33, Stating Horse Power You Need.

**COLUMBUS MACHINE COMPANY**  
Columbus, Ohio.

It's the  
**SPARK**  
that  
COUNTS

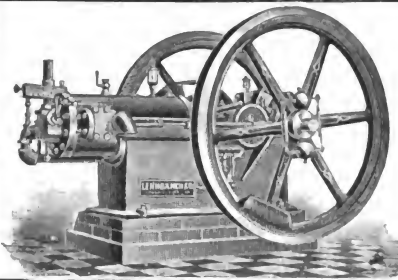


**YOUR ENGINE** will work better, give you less trouble and carry a bigger load, if you ignite with one of our **Improved Mueller Spark Coils**.  
Furnished for use with batteries or dynamo. **WE GUARANTEE** our coils against all imperfections in workmanship and material. If your engine doesn't ignite properly, write us. Information cheerfully given. Correspondence solicited.  
**INDUCTION COIL CO.**  
9-10-11 MILLER BLDG. MILWAUKEE, WIS.



**PATENT LIGHTNING PORTABLE HAND PUNCH.**  
Several sizes. Capacity up to ¼ inch plate. Indispensable in any shop.

SEND FOR CATALOGUE AND PRICES.  
**AMERICAN LOCK NUT CO., OREGON, ILL.**



### Lennox Gasoline Engines

MADE IN ALL SIZES.

Built especially for Blacksmith shop power. It means money in your pocket to find out about our engines before placing your order.

WRITE AT ONCE FOR NEW FREE CATALOGUE.

**Lennox Machine Company,**  
110 9th Ave., MARSHALLTOWN, IA.

### Perfect Cooling with Small Water Supply

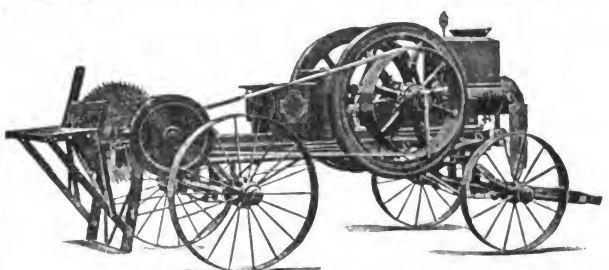
Attractive proposition, isn't it? This is only one of the many SPECIAL features found on the

### "EASY STARTING" LAUSON LINE.

5, 6 and 8 H. P. Self-Contained Hopper Cooler. 6 to 20 H. P. with Improved Screen Cooler.

Write for 1905 Catalog and Dealers' Discounts. Mention this paper.

STATIONARY and PORTABLE, with or without Saw Attachment.



"LAUSON" SPECIAL, with Saw Attachment.

**THE JOHN LAUSON MFG. CO., New Holstein, Wis.**

### OTTO ENGINES

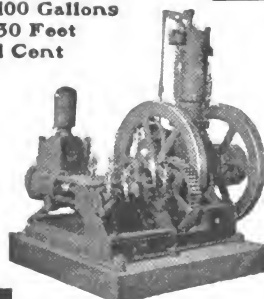
### Quality vs. Price

The day of the cheap engine is rapidly passing. The last two or three years of experimenting with the unreliable wasteful kind has done the work. The false economy of it has been clearly shown. The sound business sense of the power-using world is reasserting itself. The reputable manufacturer who has withstood the temptation to sacrifice quality to price is again coming into his own. "Otto" sales are doubling and "Otto" quality is in demand. Our booklet "Some Reasons Why" tells. Send for it.



**OTTO GAS ENGINE WORKS, Phila, Pa.**  
**STANDARD OF THE WORLD**

100 Gallons  
30 Feet  
1 Cent



### Fairbanks-Morse Domestic Water Supply

Provides all the conveniences of city water works at moderate cost

Gas, Gasoline or Kerosene Engines for all purposes from 2 h. p. up.

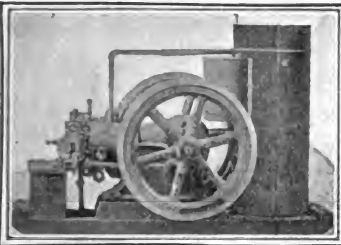
Cut out complete advertisement and send to  
**Fairbanks, Morse & Co.**  
Monroe St. Chicago, Ill.

Please send me Illustrated Catalogue No. W 487 Gasoline Engines.

I may want.....h. p. to.....

Name.....Street No.....  
Town.....State.....





Designed for the Blacksmith. **Our 4 H.P. Engine**

Fills every shop requirement and is always ready for business. Giving perfect satisfaction to hundreds of shop owners. Simple, strong, substantial. Best material and finest workmanship. Write for our Catalogue. Sent free for the asking. **ROCKFORD ENGINE WORKS, Rockford, Ill.**

**STARRETT  
& TOOLS**

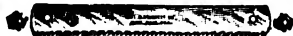
THE  
STANDARD  
FOR

ACCURACY, DESIGN, WORKMANSHIP, FINISH,

**L. S. Starrett says:**

"If you find any better tools than Starrett Tools—buy them."

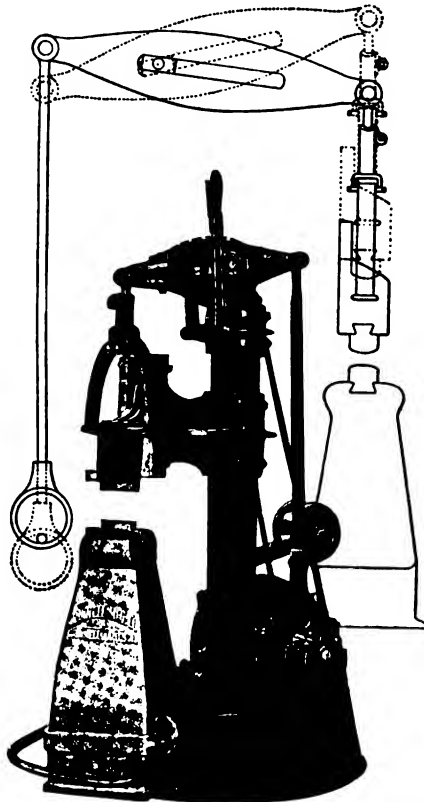
**HACK SAWS**



**STARRETT QUALITY.**

Complete Catalogue No. 17 A.H. sent on request. You ought to have it.

**THE L. S. STARRETT CO.,**  
ATHOL, MASS., U. S. A.



**MODERN POWER  
HAMMER.**

Occupies little space.  
Durable.  
Easy running.  
Reliable.  
Neat.

Powerful.  
Only practical adjustable stroke.  
Wide range of work.  
Easy to operate.  
Ready at all times.

Heavy or light blow.  
At any speed.  
Makes smithing easy.  
Many in use.  
Every shop should have one.  
Reasonable in price.

**GRINNELL MFG. CO., GRINNELL, IOWA.**

# Kerrihard's Power Hammer

THE MOST VALUABLE ADDITION YOU COULD MAKE  
TO YOUR EQUIPMENT. ADAPTED TO ALL KINDS OF  
SHOP WORK. THE MOST EFFICIENT HAMMER ON SALE

**THE KERRIHARD HAMMER**  
IS FULLY GUARANTEED.  
A RELIABLE MACHINE MADE  
BY A RELIABLE FIRM, GIVING  
SATISFACTION EVERYWHERE

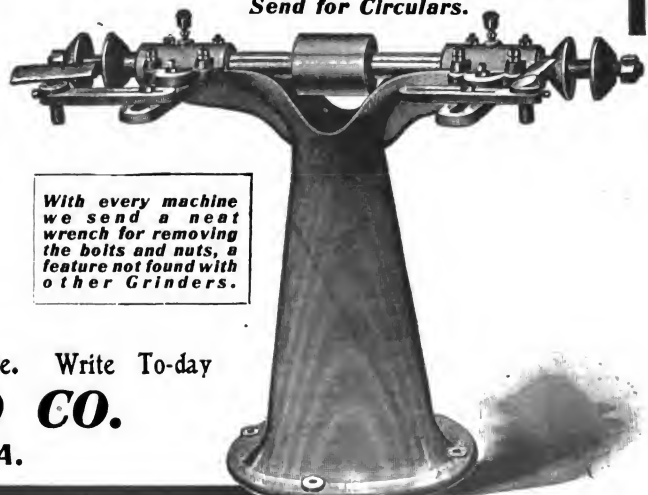
Height over all - - 55 in.  
To top of Anvil Block 31 in.  
Floor Space - - 18 x 30 in.  
Weight - - - - 700 lbs.

**KERRIHARD HAMMERS PRO-**  
DUCE BEST WORK. THEY  
CONTAIN ONLY THE VERY BEST  
MATERIAL AND ARE MADE BY THE  
MOST SKILLED WORKMEN. ❦ ❦

**OUR NEW  
EMERY GRINDER**

is Especially Designed for the Blacksmith Trade.  
Will Carry Wheels 20 in. in diam., 3 in. thick or  
smaller with 1 1/4 hole. Price most Reasonable.

*Send for Circulars.*



*With every machine  
we send a neat  
wrench for removing  
the bolts and nuts, a  
feature not found with  
other Grinders.*

Interesting Circulars and Price List Sent Free. Write To-day

**THE KERRIHARD CO.**

RED OAK, IOWA, U. S. A.

## Two Good Works on Horseshoeing

**A Text Book on Horseshoeing**, by A. Lungwitz. A complete treatise on anatomy, shoeing, bad feet, interfering, etc. Cloth bound, 168 pages, 141 illustrations..... **\$2.00**  
**Magner's A B C Guide** to sensible horseshoeing. Cloth bound, 130 pages, 400 illustrations..... **1.00**  
 Sent postpaid on receipt of price.

**IT TELLS YOU HOW TO PAINT** Carriages, Wagons and Sleighs. Gives full directions for all kinds of work. Full of good receipts and useful hints.

**Practical Carriage and Wagon Painting**—A new enlarged edition of a standard book by M. C. Hillick, price, postpaid..... **\$1.00**

**AMERICAN BLACKSMITH CO., Box 974, Buffalo, N. Y.**

THE

## Little Giant

**Combined Punch and Shear.**

**The Most Powerful Lever Punch and Shear Made.**

This is not a new machine—only a new cut showing the improvements we have lately added—making it more valuable for the blacksmith. It is made in three sizes. No. 1 will punch  $\frac{1}{2}$  in. hole in  $\frac{3}{4}$  in. iron; cuts iron  $\frac{1}{2}$  in. thick and 1 inch round. Weight, 500 lbs. No. 2 will punch  $\frac{1}{2}$  in. hole in  $\frac{1}{2}$  in. iron; cuts iron  $\frac{1}{2}$  in. thick and  $\frac{3}{4}$  in. round. Weight, 350 lbs. No. 3 will punch  $\frac{1}{2}$  in. hole in  $\frac{1}{2}$  in. iron; cuts iron  $\frac{1}{2}$  in. thick and  $\frac{3}{4}$  in. round. Weight, 275 lbs. Each machine is equipped with five sets of punches and dies. This machine is made for the blacksmith shop and we DO claim that it is decidedly the best on the market for that place, and can furnish any amount of testimonials to that effect.

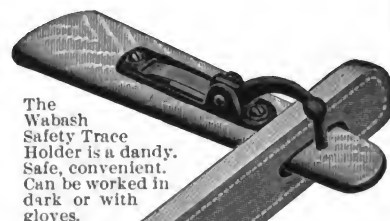
For Sale by your Jobber. If Not, Write Us. Send for Circular.

**LITTLE GIANT PUNCH & SHEAR CO., Sparta, Ill.**



## An Attractive Offer

is here made to get you acquainted with our rapid selling specialties. Blacksmiths and wagon men all over the country are making nice profit by selling our goods, with no trouble at all. Only a few specialties are shown here.



The Wabash Safety Trace Holder is a dandy. Safe, convenient. Can be worked in dark or with gloves.

Harsh's Dash Line Holder is a convenience every vehicle owner appreciates.



I X L

**For 50 Cts.**

We will send you postpaid

1 pair I X L Anti-Rattlers,  
1 pair Safety Trace Holders,  
1 Dash Line Holder.

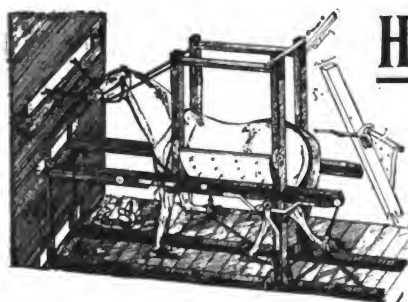
Our I X L Anti-Rattlers are easily put in and are guaranteed to stop rattle of pole or shaft.

For \$1.25, we will send postpaid a dozen pair of single safety trace holders, or For \$1.50, one dozen pair of double safety trace holders. **WRITE TODAY.**

Write for our Circulars and Price List.

**Lauder, Harter & Harsh Mfg. Company**

20-30 So. Miami St., Wabash, Ind.



**Hemphill's**

**New Shoeing Stocks**

**THE BEST!**

**Read What Users Have to Say**

Newark, Ohio.  
"I have bought one of Hemphill's Shoeing Stocks and it operates to my entire satisfaction and I am more than satisfied with it in every way. I have shod stallions weighing 2200 pounds, who fought from start to finish and could do no harm to themselves or my men."

THEODORE LOWENDICK."

Why?

Because they are the strongest, they will not break and need no repairs. There are no cogs, springs or dangerous cranks about them. Can be used in any building, as there is no strain whatever on the walls. We do not use a vise-like clamp to hold the foot and there is no danger of the horse straining his leg.

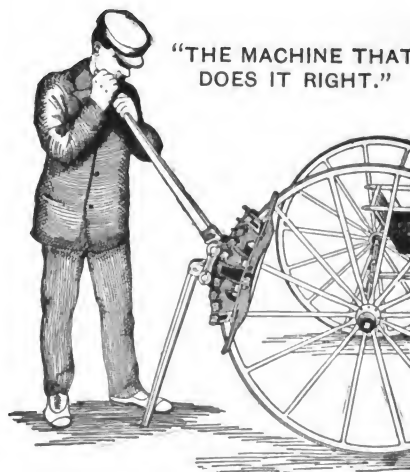
The shoulder rope can be secured instantly and it holds the horse so that he can not rear up or get away. When he is shod he is released by simply pulling a lever, which drops the sling. These two features are most essential in a shoeing stock but are not found in any other machine. No trouble to set up or use them. Low prices and liberal terms.

Write for further particulars.

**M. L. HEMPHILL, Rensselaer, Ind.**

**To Try One is to Buy One and Don't You Forget it, You Will Never Regret it.**

## SCHAU TIRE SETTER



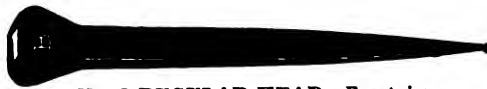
"THE MACHINE THAT DOES IT RIGHT."

3,000 in use in the United States and Canada

Write for Catalogue.

**BURTT MFG. CO.**

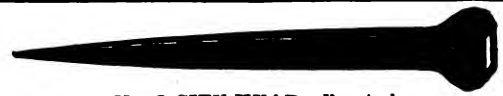
**Kalamazoo, Mich.**



No. 8 REGULAR HEAD.—Exact size.

**"BRIGHTON" HORSE NAILS**

The letter "B" appears on the head of each nail.



No. 8 CITY HEAD.—Exact size.

The **EQUAL** of ANY Nail except  
**"NEW STANDARD."**

**DEALERS' NET PRICES TO SHOERS.**

**TRY A FEW OF THEM**

and be convinced of above statement.

No.....	5	6	7	8	9	10	11	12
Box....	\$3.25	3.00	2.85	2.75	2.70	2.65	2.65	2.65
Lb.....	.13	.12	.11½	.11	.11	.11	.11	.11

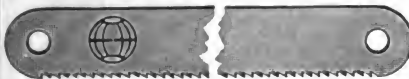
Manufactured by

FOR SALE BY ALL DEALERS.

**STANDARD HORSE NAIL CO., New Brighton, Pa.**

**Your Hack Saw Troubles**

will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



**West Haven Manufacturing Co.**  
NEW HAVEN, CONN.

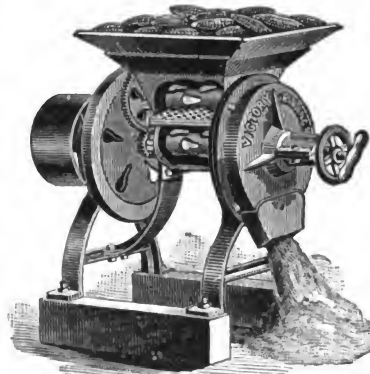
**NATIONAL SELF-OILING STEEL TUBULAR AXLES**

Now made  
of high  
carbon steel.



Guaranteed to be stronger and more rigid than solid steel axles. We make both. Write us

**National Tubular Axle Co., EMIGSVILLE, PA.**



**ATTENTION!**

We want you to represent us in your locality selling

**The Victory Corn  
and Feed Mills.**

Oldest and Best Grinding Mill Made. **STRONG, SIMPLE, DURABLE.** Especially adapted to grinding ear corn, shelled corn, wheat, oats, rye, etc. Write for Prices and Particulars today.

**THOMAS ROBERTS,**  
(Established 1876.) **Springfield, Ohio.**

**ELECTRIC FORGE BLOWERS**

**EXCEL ALL OTHERS**

A GOOD  
BLOWER  
THAT  
BLOWS  
EVERY  
BODY  
GOOD



Write  
for  
Prices  
and  
Circulars

MODERN MACHINERY  
MAKES THE SMITH'S  
WORK  
LIGHTER

**ROTH BROS. & CO.**  
27-29 So. Clinton Street,  
CHICAGO, ILL.

**RICH'S NEW**

**ARTISTIC  
HORSESHOEING**



**MY LATEST BOOK  
ARTISTIC HORSESHOEING**

SHOULD BE IN EVERY UP-TO-DATE SHOP.

**THE PROGRESSIVE SMITH**

will find it invaluable in his every day work. A practical, scientific treatise on improved methods of shoeing. Special directions given for correcting faulty action in trotters and for shaping shoes to cure different foot diseases. 284 different styles of shoes illustrated and explained. *Cloth bound, 217 pages, Price \$2.00.*

—AGENTS WANTED.—

**Prof. GEORGE E. RICH, 239 S. Main St., AKRON, OHIO.**

**IRON**

ANGLES, BARS, PLATES, SHEETS, RIVETS, PIPE,  
SHAFTING, ETC.

**STEEL**

Kept in stock at Cleveland for immediate shipment,  
or forwarded direct from mills at lowest market prices.

SEE MONTHLY STOCK LIST.

**THE  
BOURNE-FULLER CO.**

**IRON, STEEL**

**PIG IRON**

**COKE**

**Cleveland, Ohio.**

## Your Name on a Calendar

There is no better advertisement for the money than a good calendar with your name on it. It lasts a year and the man you present it to is reminded of you every day—each time he looks at his calendar. This page will tell you how to get a supply of calendars with your name on them to give to your customers at New Year's.

In accordance with the usual custom, we shall present ONE COPY OF OUR ATTRACTIVE 1906 CALENDAR FREE to each of our readers whose subscription is paid to or beyond January, 1906. This calendar is 5 1-2 by 9 1-2 inches and is shown here in miniature—an appropriate smithy subject. If your subscription expires before January, 1906, renew now so as to be in line for one of these souvenir calendars free.



This illustration shows the design. The calendar itself is 5 1-2 x 9 1-2 inches. Sample one sent prepaid, for 15 cents.

When having these calendars made, we laid in a few extra to supply those readers who might want some to advertise their own shops. This idea which we introduced last year was immensely popular, and the demand this year bids fair to exhaust the supply even earlier. We offer these extra calendars to our subscribers in lots of 50 or 100 at a price that just covers our own expenses. In other words you get a Wholesale Price on a Small Lot. These calendars will bear no advertising except your own name and business address after the words "Compliments of" and will be sent carriage prepaid. They are offered to subscribers of The American Blacksmith only. While they last we can deliver immediately upon receipt of order but would advise those to order now who do not want to be disappointed.

This calendar offer is made, first, as an accommodation to readers who want a few calendars, cheap, yet attractive, unlike anybody else will have; and secondly, to induce those readers whose subscription expires before January, to renew promptly according to the following liberal combination offers:

- (1) 50 calendars, your name on each, postpaid, \$2.00
- (2) 50 calendars and one year's subscription . \$2.75
- (3) 50 calendars and two years' subscription . \$3.25
- (4) 50 calendars and four years' subscription . \$4.00

Prices include postage or express charges. If you are flush we recommend that you take advantage of offer No. (4), as it is unusually liberal. If you want 50 extra, 100 in all, add \$1.50. Owing to the great demand and small supply, no more than 100 will be sold to any one person.

IF NOT ALREADY A SUBSCRIBER you can well take advantage of offers (2), (3) or (4).

OWING TO THE IMMENSE NUMBER OF THESE SMALL ORDERS IT IS IMPOSSIBLE TO OPEN ACCOUNTS ON OUR BOOKS FOR EACH ONE. HENCE, KINDLY SEND CASH WITH ORDER. REMIT BY MONEY ORDER, EXPRESS ORDER OR REGISTERED LETTER.

DON'T DELAY, IF YOU WANT FIFTY CALENDARS TO HAND TO YOUR BEST CUSTOMERS AT NEW YEARS'.

## AMERICAN BLACKSMITH COMPANY,

P. O. Box 974, BUFFALO, N. Y.





**E**VERYBODY WANTS IT, EVERYBODY NEEDS IT. Every progressive blacksmith should be willing to consider a clean money-making proposition.

The large number of blacksmiths who are now doing cast iron brazing find it a profitable business. The brazing of cast iron is no longer an experiment as has been demonstrated to the most skeptical in all parts of the country. Read the testimonials below. We have hundreds more just like them.

## ONE DOLLAR

invested now will start you in this profitable business. Our compound **"BRAZIT"** and your mechanic's knowledge of heating iron is all that is necessary. No special equipment is required. The work is done in your forge or with a brazing torch.

The field for cast iron brazing is unlimited. Many articles made of cast iron are being broken daily in every community. These are discarded as worthless and must be replaced by new ones at large expense. With **"BRAZIT"** you can mend them as good as new, charging a good price for the work and finding the owners of the broken parts more than willing to pay your price. It is easy to see why this is so when you remember that you are saving them not only the cost of replacing their broken casting but the expense incurred by the delay waiting for a new one to replace it. When properly used **"BRAZIT"** is guaranteed to successfully mend broken parts of machines, gears, agricultural implements, pumps, wind-mills, printing presses, pulleys, engines, stoves, automobile parts, sewing machines, lawn mowers, tools of all descriptions and anything made of cast iron.



**"BRAZIT"** will also successfully mend cast iron to wrought iron and steel to cast iron and all the joints will be as strong as before they were broken.

SOUTH DARTMOUTH, MASS.  
I have used your compound and it worked O. K. Wish I had had some of it before. THEODORE BRIGHTMAN.

SHARON, S. C.  
I received the trial set of "Brazit" and can say it beats anything I ever saw. It does just as claimed. I put together a broken piece of cast iron and it was stronger than before it was broken. C. P. LOWRENCE.

WESTFIELD, MASS.  
We acknowledge the receipt of your sample of "Brazit," which we have tried and found satisfactory. POPE MANUFACTURING CO.

Hundreds of blacksmiths are using **"BRAZIT"** regularly, and find it to be a profitable side line. We want you to take up the work in your section. It means money in your pocket. You invest practically nothing, and the profits are large. In order to get you started, we have put up a one dollar sample working set with which you can braze a large number of pieces.

**We Send this Set for \$1.00**

**Postpaid to any part of the World.**

You cannot afford to overlook this opportunity. Send \$1.00 to-day and we will forward the set immediately, sending you printed directions.

OUR REGULAR WORKING SET, a Complete Outfit,  
with full plain directions, will be sent to any address for **\$5.00**

**U. S. Brazing Compound Co.,**  
(INCORPORATED)

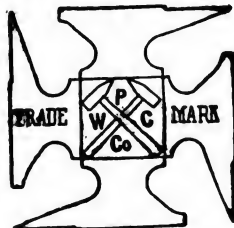
113-115 So. Second St.,

NEW BEDFORD, MASS.

**YOU WILL NEVER FAIL**

*To Make a Strong, Clean Weld If You  
Use Perfection Welding Compound.*

We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



Perfection Welding Compound will do the trick quickly and neatly. It makes a stronger weld than any other compound manufactured, as proven by the tests it has undergone. Send for free sample.

PRICE CONSISTENT WITH QUALITY.

**PERFECTION WELDING COMPOUND CO., SCRANTON, PA.**

**A LARGE FREE SAMPLE**

SENT TO any BLACKSMITH ON REQUEST

**BANNER  
TOE-CALK  
COMPOUND**

**SPECIAL OFFER:** We will send 20 lbs. of the famous Banner Welding Compound and also give you free a fine \$1.50 leather apron upon receipt of **\$2.00**

Pat. May 10, 1904.

**BANNER BRAND WELDING COMPOUNDS**

Are used in the Best Shops in this Country. Always give greatest satisfaction. Save time, fuel and labor and make a solid weld every time.

**ASK  
YOUR  
DEALER**

For 3A Banner Welding Compound for General Work, and Banner Toe-Calk Welding Compound for fine Toe Calk Work.

Guaranteed to Weld at a low heat. Does not fly. SEND FOR SAMPLE TODAY. Banner once used always used.

**CORTLAND SPECIALTY CO., CORTLAND, N. Y.**

SOLE MANUFACTURERS.

**BANNER  
WELDING  
COMPOUND**

Send Name and Address today.

MILNEERSVILLE, Ohio, August 4, 1905.

Buffalo Forge Co.,

Buffalo, N. Y.

Gentlemen:—

Please find money order for No. 200 Buffalo Blower.

It is the best Blower that I have ever used. It takes up the least room, gives a good uniform blast and cannot be surpassed for ease of operation. It is all you claimed for it and more too.

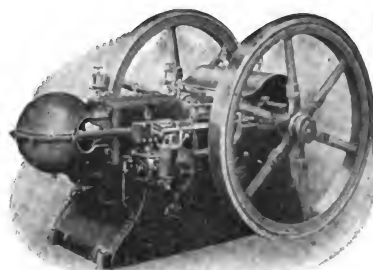
Wishing you unbounded success, I remain,

Yours Respectfully,

S. B. HAZLETT.

**LIGHTNING BALANCED**

**GAS and GASOLINE ENGINES**



**Are Especially  
Suited for  
Blacksmith Shop  
Power.**

Write for Free Catalogue.

**KANSAS CITY HAY PRESS CO.,**

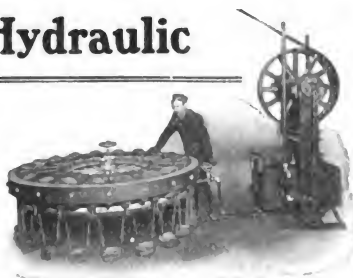
482 Mill Street,

KANSAS CITY, MO.

INVESTIGATE THE

**Hercules Hydraulic**

**Before  
You  
Buy a  
Tire Setter**



**National Machine Co.**

KEOKUK, IA.

**Henderson Hand Power TIRE SETTERS**

Set Tires Cold.  
Keep the Dish right  
Tighten Wood Work  
Pull Broken Spokes  
Jump in New Spokes  
Are Money Makers



**Standard Tire Setter Co.**

KEOKUK, IA.

**HAY-BUDDEN SOLID WROUGHT ANVILS**

**The Gold Medal Anvil  
Highest Award**

OMAHA, 1898 PAN-AMERICAN, 1901

Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS.



OVER 100,000 IN USE

**WARRANTED**

Experience has proved their worth and demonstrated that "HAY-BUDDEN" Anvils are Superior in Quality, Form and Finish to any on the Market.

**HAY-BUDDEN MFG. CO., BROOKLYN, N. Y.**



# AMERICAN BLACKSMITH

BUFFALO  
N.Y. U.S.A.

A Practical Journal of Blacksmithing and Wagonmaking

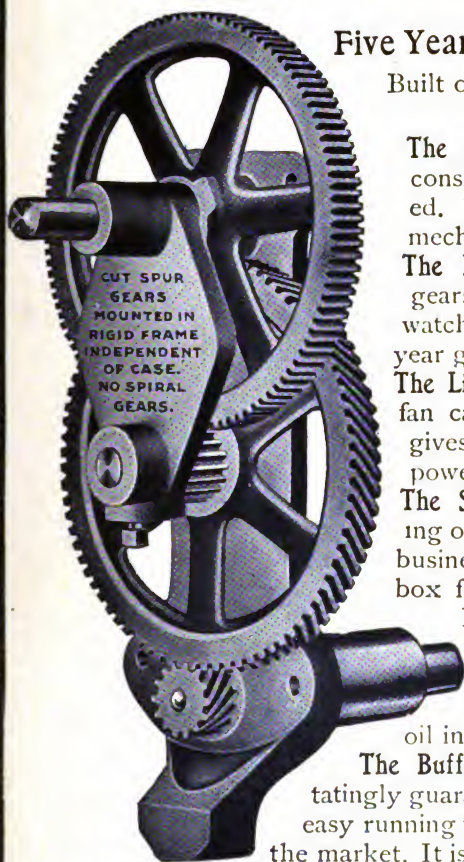
JANUARY, 1906

\$1<sup>00</sup> A YEAR  
10<sup>c</sup> A COPY

## Buffalo 200 Blower

"PRIDE OF TODAY'S SMITHY."

Five Year's Protection against Repairs.  
Built on Modern Mechanical Principles.



Gearing Used on Buffalo  
No. 200 Blowers.

The Simplest Blower made—no constant close adjustment needed. That is done once for all by expert mechanics in our own factory.

The Most Durable Blower—look at the gears, strong, large and heavy. No watch-case mechanism can stand a five year guarantee.

The Lightest Running Blower—our scroll fan case is the correct scientific one and gives more air per revolution with less power than any other form.

The Sturdiest Blower—no racking twisting or battering strain can put it out of business. Gears are held in a cast iron box frame with extra length bearings. Nothing made stronger.

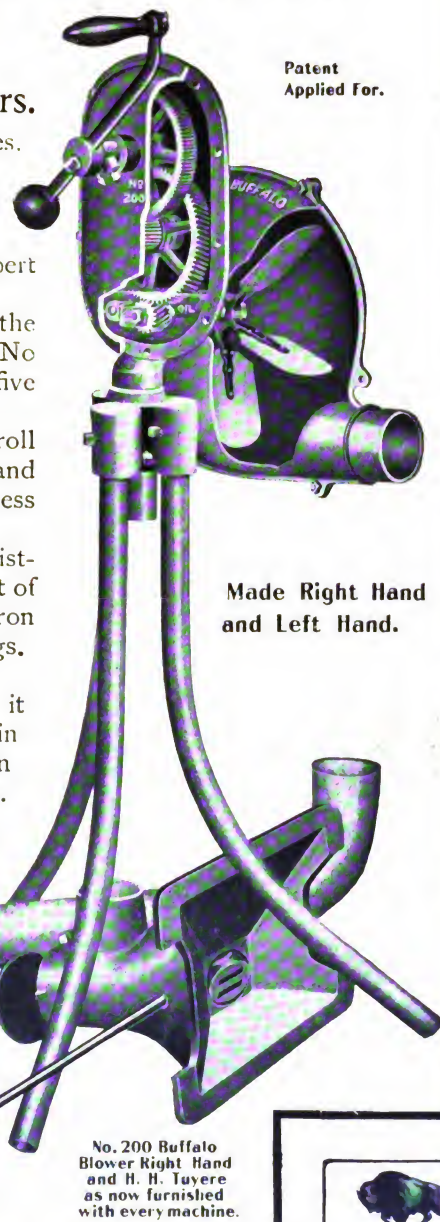
The Busy Man's Blower—oil it once a month and it is always in perfect condition. Gears run in oil in an air tight dust proof case.

The Buffalo No. 200 Blower is unhesitatingly guaranteed to be more durable and easy running than any other blower on the market. It is sold under a positive guarantee for five years and any part wearing out within that time will be replaced free of cost.

*Send for a copy of our latest Catalogue*

Canadian friends: Save duty, buy of The Canadian Buffalo Forge Company, Ltd., Montreal, Quebec.

BUFFALO FORGE COMPANY, BUFFALO, N. Y.



No. 200 Buffalo  
Blower Right Hand  
and H. H. Tuyere  
as now furnished  
with every machine.





# CARRIAGE MAKER and BLACKSMITH TOOLS

## THE "ELITE" BLOWER

is correctly manufactured and is designed to meet the demands of hard service, together with the greatest possible efficiency, durability and convenience.

IT'S A  
MONEY  
MAKER.



Fig. 900, 12 inch.

Manufactured by

THE  
SILVER MFG. CO.

365 BROADWAY  
SALEM, OHIO  
U. S. A.

Hub Boxing Machines, Spoke Tenon Machines, Band Saws, sizes 20, 26, 32 and 36 inch, Forges, and a complete line of hand and light Power Drills, a 19-inch Post Drill and a 20-inch Round or Square Base Drill with Lever or Screw Feed. The last two drills are used extensively by Carriage Builders and others.

THESE ARTICLES  
ARE  
GUARANTEED  
AS  
REPRESENTED.

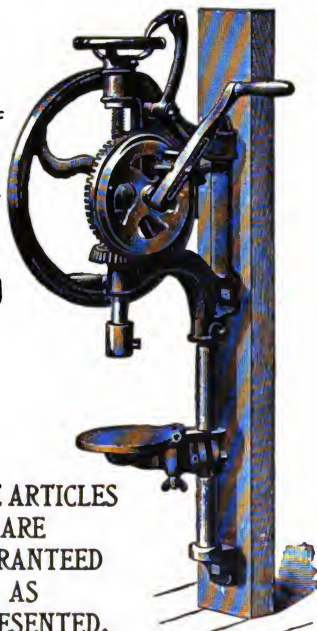


Fig. 731, No. 1.

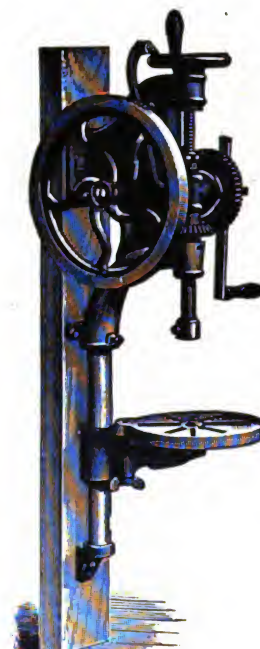


Fig. 742, No. 12.

Special prices are extended to Carriage Makers and Smiths if this paper is mentioned.



Fig. 850, 20 inch.

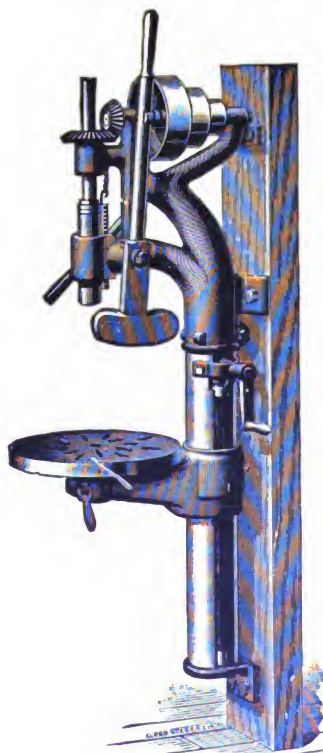


Fig. 727, 19 inch.

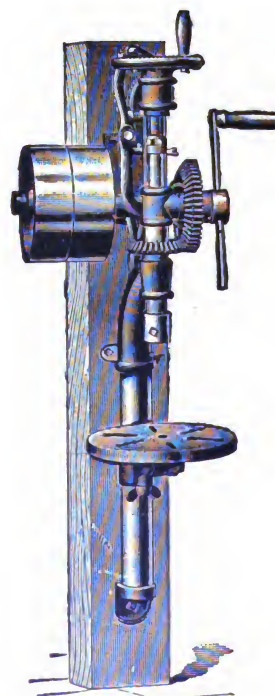


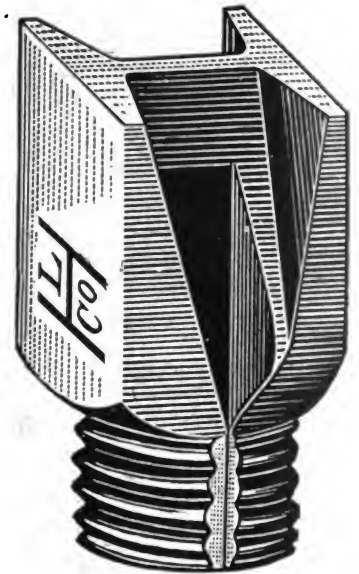
Fig. 746, No. 12.



# PATENT



# H



# CALK

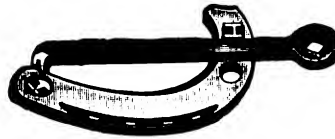
ALWAYS SHARP! NO SLIPPING OF THE HORSE.  
NO INJURIES AS CAUSED BY OTHER CALKS!  
GREAT SAVING OF HORSES AND HORSESHOERS.

Guaranteed to Outlast Every Other Device of  
The Kind.



WHEN NEW!

Can be Removed Even if Worn  
Down to the Shoe.



HALF WORN!  
Always Sharp!

H Calks have been  
in use over  
25 years

Sold to Horseshoers  
Only

H Calks have saved more  
horses than all other de-  
vices of the kind together

THE ONLY INSERTIBLE HORSE SHOE CALK USED IN THE  
GERMAN, RUSSIAN AND AUSTRIAN ARMIES.

Write for Circulars and Price List.

## H CALK CO.,

16 Beaver Street

NEW YORK CITY

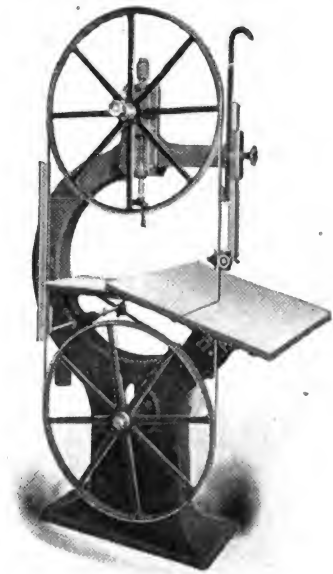
# Our New Combinaton SAW TABLE

Made with Tilting Table and furnished either with or without Boring attachment. Guaranteed to give perfect satisfaction.

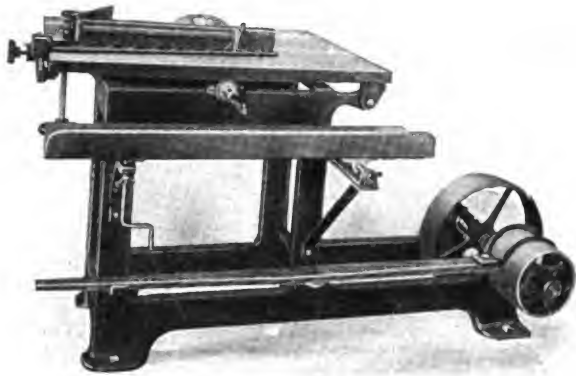
## CIRCULARS

NOW

READY.



**"DEFIANCE"**

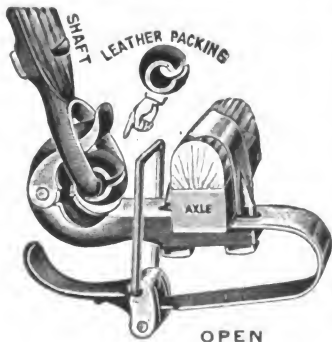


No. 3½

32-inch Band Saw, which we also make in 27-inch and 36-inch size.

**THE SIDNEY TOOL CO.**  
**SIDNEY, OHIO.**

# THE BRADLEY SHAFT COUPLING



OPEN

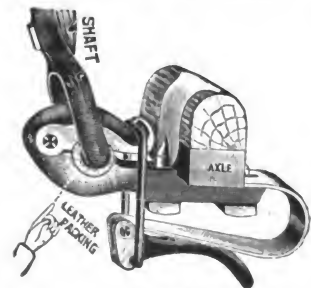
## Ball Bearing, Leather Packing Automatic Take-Up

QUALITY AND ADVANTAGES CONSIDERED IT IS THE  
CHEAPEST AND BEST ON THE MARKET

**ALL** STEEL  
RIGHT THE TIME

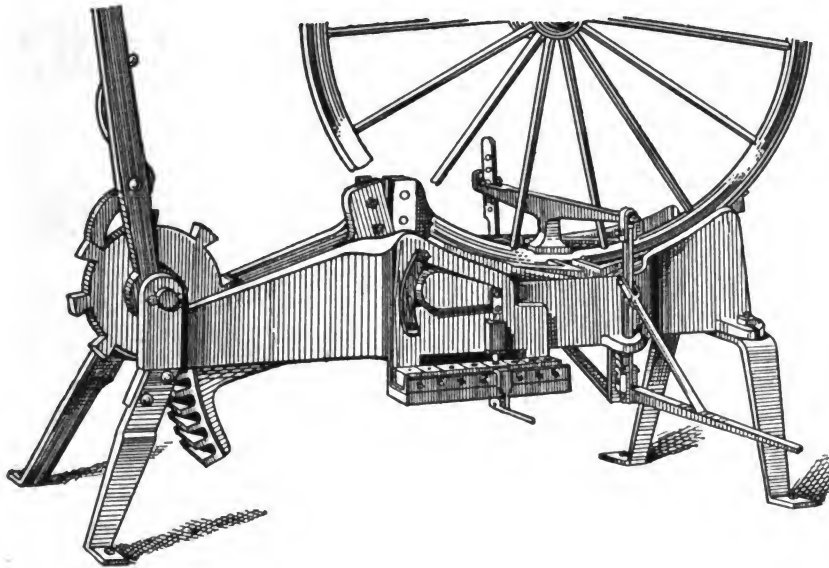
We are prepared to furnish the Buggy Size Shaft Ends with long length irons from 28 to 34 in. long, with 8 or 10-in. "T" piece, irons 5-16 x 1½ in. in section.

**C. C. BRADLEY & SON, Syracuse, N. Y.**



CLOSED

# THE NEW HOUSE COLD TIRE SETTER



This Cut shows our Latest Improved  
COMBINATION

## Cold Tire Setter, SHEAR AND PUNCH,

which is in every way a marvelous success and of which we are very proud. It is a product of many months hard study and a great deal of costly experimenting, and achieved through our many years of practical experience in wheel work and tire setting, coupled with our four years of successful experience with our former Cold Tire Setter.

To prove to you that our success did not come through ease or accident, we will state to you that these latest improvements granted to us are covered by the fourth patent, three of which have been issued in the last 12 months.

We claim that our **Cold Tire Setter** is the

## ***Best Machine Ever Offered to the Trade***

It is in every way a better Cold Tire Setter than our Former Machine.

IT IS

## Simpler and Stronger

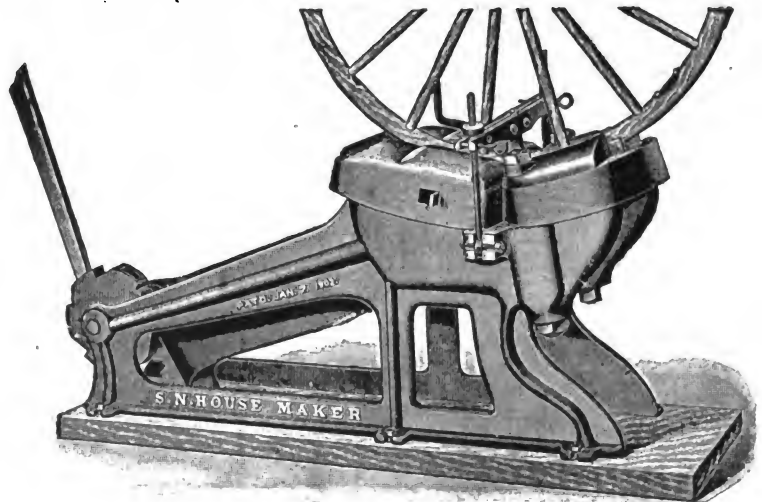
AND

## CAN'T BE BROKEN

And can't get out of fix, the frame having been made solid and strong for tire setting, and by using the same for

## SHEAR AND PUNCH

we are able to produce the best in the world, and the additional cost to us is so small that we make no additional charge for them, and are thereby enabled to make our customers a present of at least an \$80 Shear & Punch. Write us for Catalogue and Prices.



This is a cut of our old style machine, and it was the first and is the only practical and successful COLD TIRE SETTER the World has seen. We have thousands of them in use today and there is not one abandoned or broken up. In fact our oldest customers are our best pleased ones.

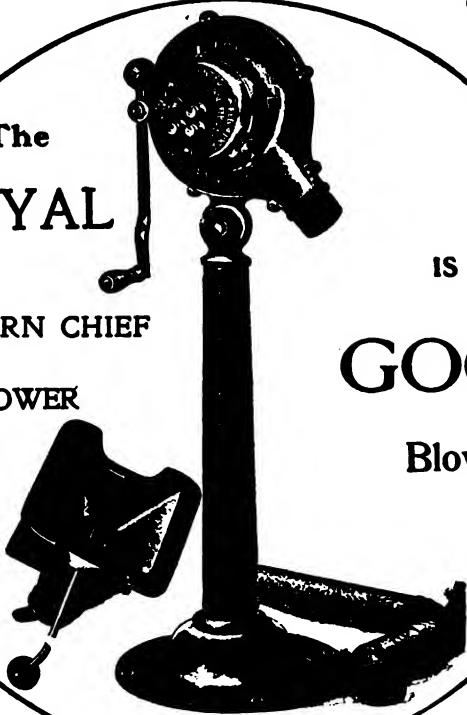
## ***THE HOUSE COLD TIRE SETTER CO.,***

Office and Factory, 216-220 So. Third Street, ST. LOUIS, MO.,  
and Jullus F. House, 40 Church St., Toronto, Canada.

# THREE GOOD THINGS

"ASK THE DEALER."

The  
**ROYAL**  
WESTERN CHIEF  
BLOWER  
IS A  
**GOOD**  
Blower



## ROYAL BLOWER

Crank turns right or left.  
Its operation is easy and noiseless.  
Blast is powerful. After-blast lasting.

Gears and Boxes are phosphor bronze and steel.

No spiral or worm gears.

Fan, 12 inches. Weight 100 lbs.

Fire-pot measures 9x11½x4 in. inside.

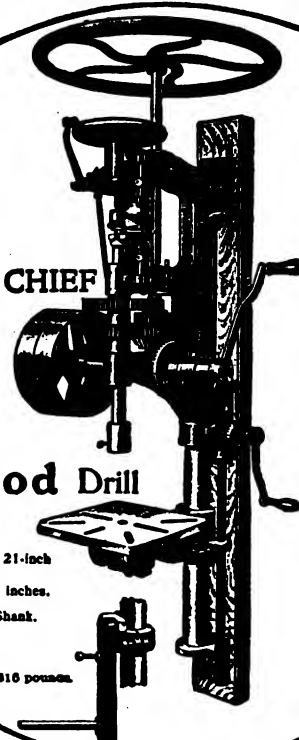
## No. 14 DRILL.

This Drill has set the pace for all.

It simply does everything itself.

Seems to have brains.

THE  
WESTERN CHIEF  
DRILL  
No. 14  
Is a Good Drill



Drills to center of 21-inch Circle.  
Bores from 0 to 1½ inches.  
Takes Bits ½ or ¾ Shank.

Weight, 315 pounds.

It has independent quick return by means of which the operator can rapidly withdraw the bit at will, without stopping or reversing motion of machine. Or it can be set to drill any depth desired and will automatically (whether running by power or hand) reverse itself, withdraw the bit, and start drilling again and again indefinitely; all without stopping the motion of machine, or turning it backward. This feature is independent of Drill, and need not be used unless desired.

It has mechanical device for raising and lowering the table.

The  
Royal

No. 100

Forge

Is a  
Good

Forge



Hearth, 38½x46 inches.  
Fan, 12 inches.  
Height, 50 inches.  
Weight, 275 pounds.  
Length over all, 54 inches.

No. 100 ROYAL FORGE—An all-around Forge for the lightest and heaviest work.

We have about one hundred other "GOOD THINGS" in the way of Forges, Blowers and Drills for you to select from.

## CANEDY-OTTO MFG. CO.

CHICAGO HEIGHTS, ILL.



# BARCUS STOCKS

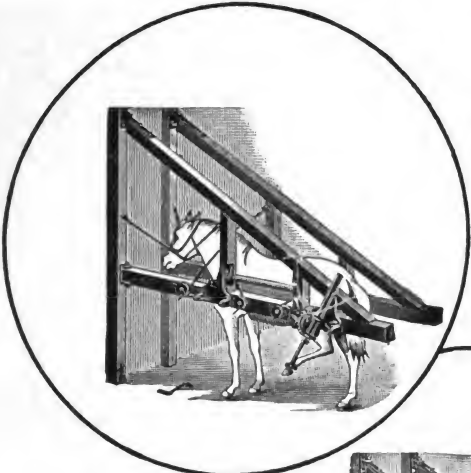
THE MOST POPULAR AND THE MOST RELIABLE SHOEING RACK ON THE MARKET TODAY. \* \*

NOTED FOR THEIR SUPERIOR QUALITIES AND MANY ADVANTAGES OVER ALL OTHER SHOEING DEVICES. EVERY ONE GUARANTEED

OUR CLAIM IS

## NOT THE CHEAPEST BUT THE BEST

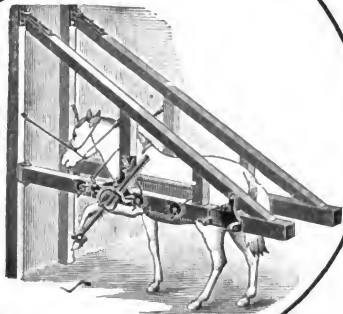
DON'T TAKE OUR WORD FOR IT  
READ THESE TESTIMONIALS. WE HAVE HUNDREDS MORE. WRITE TO US AND WE WILL SEND YOU A BOOK FULL OF THEM



### BARCUS Stocks

Can be quickly adjusted to any position convenient to the shoer. No ropes or pulleys to tangle or break. No bracing to floor or ceiling. Simple and easy to operate. Solid, safe, and sure to hold. No risk of being injured. . . .

Machine is complete with the hinges, ready to bolt to the stationary posts in your shop.



### The Barcus Toe Calk Machine

A MONEY MAKER AND A MONEY SAVER.



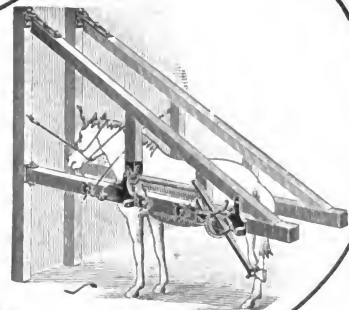
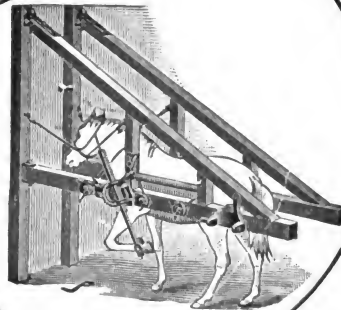
HAS A RECORD  
Of 5 Toes per Min.

WHEN IN USE THIS MACHINE WILL SAVE YOU CASH AT THE RATE OF \$6 PER DAY.

Make your own Calks from Bar Steel instead of paying high prices for Calks from the dealer. You can manufacture them yourself much cheaper. Use our new Calk Machine. Makes Calks any size or length. Write for Circulars. . .

Our complete catalogue will be sent to you free upon request. It tells all about our well known stocks and will interest you.

Write today.



ASHLAND, Ill. May 14, 1905.  
Mr. Geo. Barcus, Wabash, Ind.  
I wish to say, that the horse rack we bought of you gives perfect satisfaction in every respect.  
Yours respectfully,  
Hodgins & Douglass.

ADRIAN, Mich., Sept. 28, 1904.  
Mr. Geo. Barcus, Wabash Ind.  
Dear Sir:--I have used your Horse Stocks now for three months. Shod about 100 of the worst bronchos I ever saw with perfect success.  
Yours,  
G. F. Ball.

MINNEAPOLIS, Minn., Jun. 22, 1905  
Geo. Barcus & Co., Wabash, Ind.

Gentlemen:--In reply to your favor of the 6th would say that I cannot praise our "Barcus Horse Shoeing Rack" too highly. It is a great labor saving device and is giving entire satisfaction. I am sure if the blacksmiths throughout the country would but give the Barcus Rack a trial, your sales would be tremendous, for once having tried them, they would and could not be without a Barcus Rack. Thanking you for your attention, I am respectfully yours,  
J. YOUNG, 18 No. 2d Street,  
Minneapolis, Minn.

## GEO. BARCUS & CO., WABASH, IND. Box 61.



# An Indication of Satisfactory Service

Is the ENORMOUS AMOUNT OF BUSINESS  
placed with

## KELLEY, MAUS & Co.,

CHICAGO, ILL.,

During the Year 1905.

It is also an Undeniable Evidence of

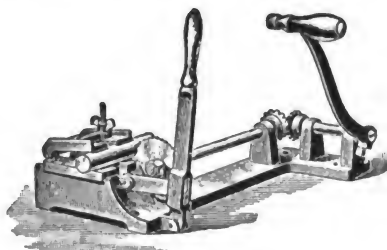
**PROMPTNESS IN FILLING ORDERS**  
at the  
**RIGHT PRICES.**

## OUR JANUARY BARGAIN SHEET

JUST OUT

Presents a Large Assortment of Materials.

**A Metal  
Cutting**



**Saw  
FREE**

WITH EACH ORDER AMOUNTING TO \$25.00 OR MORE.

Send your Orders for

**Wagon and Carriage Makers' Materials, Blacksmiths' and  
Horseshoers' Tools and Supplies**

TO

## KELLEY, MAUS & Co.

LAKE STREET BRIDGE,

CHICAGO,

ILLINOIS.

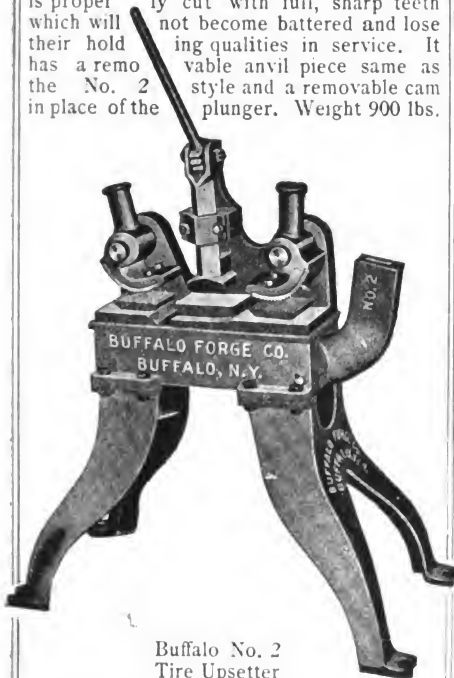


## Buffalo Tire Upsetters



Buffalo No. 3  
Tire Upsetter

THIS is a high power machine designed for the heaviest tires. It is of the edge grip type operated by a windlass through reduction gears. Grips have a throw of  $1\frac{3}{4}$  in., which, with the ten to one reduction gears, enable a force of a ton to be brought on the work with less than ten pounds pull on the wheel. Grips are faced with tool steel which is properly cut with full, sharp teeth which will not become battered and lose their holding qualities in service. It has a removable anvil piece same as the No. 2 style and a removable cam in place of the plunger. Weight 900 lbs.



Buffalo No. 2  
Tire Upsetter

THIS machine upsets  $3 \times \frac{5}{8}$  tires and axles up to  $1\frac{1}{2}$  in. square. Grips are faced with tool steel with teeth carefully cut and tempered. Lower grips adjust themselves automatically to curvature of tire or for straight work. Upset both straight and curved work. The plunger prevents all buckling or kinking. Weight 275 lbs. Height 22 in. Write for circular.

**BUFFALO FORGE CO.,**  
BUFFALO, N. Y.  
The Canadian Buffalo Forge Co., Montreal.

# JONES

1855

1905

Look for that Trade Mark on the Wheels you buy. Fifty Years of Satisfactory Service have branded . . . . .

***Jones Wheels--Best on Earth.***

ADDRESS:

**PHINEAS JONES & COMPANY,**  
**NEWARK, N. J.**

NEWMAN 1902 MODEL

**PORTABLE**

**WATCHMAN'S CLOCK.**



Made under the Rules and Requirements of the National Fire Protection Engineers, and Approved by all Underwriters. Simple, Accurate and Tamper Proof. In Service in Almost Every Large Plant and Institution. Gives Satisfaction Everywhere. Let us send you interesting circulars giving detailed description of all working parts. Write to-day for Circular B.

**NEWMAN CLOCK CO.,**  
710 Masonic Temple. CHICAGO, ILL

# PERFECT THREADS

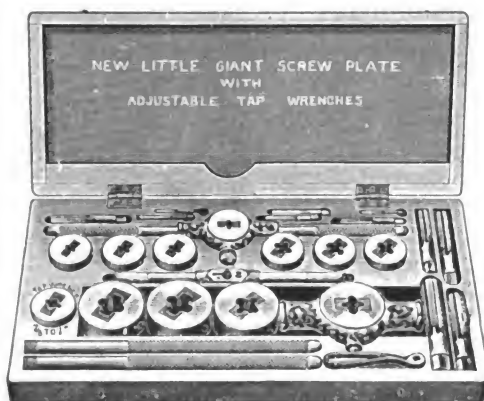
— AT A SINGLE CUT —

USE

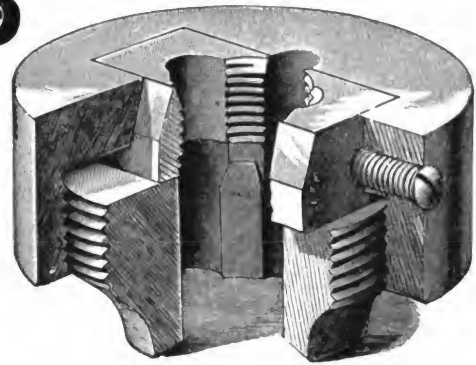
*Little Giant.*

## TAPS, DIES & SCREW PLATES

All our Plates and Machines are furnished with the **LITTLE GIANT** die. We furnish both our single and full stock screw plates with knurled handles and mottled finish. All **LITTLE GIANT** screw plates are regularly listed to contain adjustable tap wrenches of sufficient size to hold all the taps in each assortment. \* \* \*



**WELLS BROS. COMPANY,**  
GREENFIELD, MASSACHUSETTS.



THE WORDS

# LITTLE GIANT

when used in connection with  
screw cutting tools mean

## SUPERIORITY of WORKMANSHIP

Nothing but the finest material  
enter into their construction.

KNOWN WORLD WIDE FOR THEIR

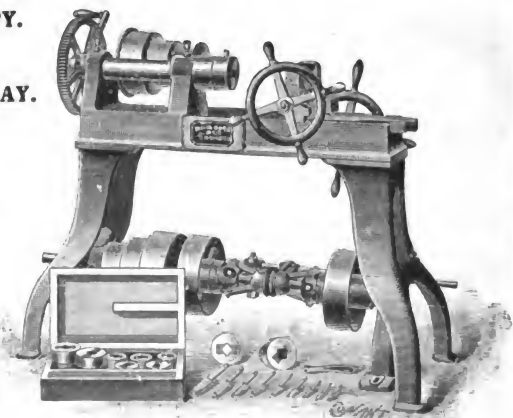
## QUALITY

A beautiful illustrated catalogue of taps, dies  
and screw plates with full description  
and price-list

**SENT FREE**

upon request.

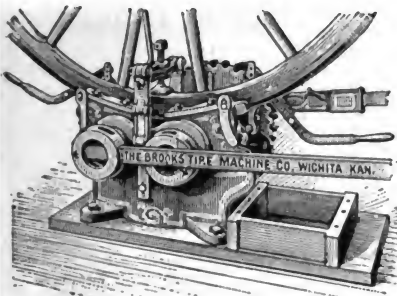
GET A COPY.  
WRITE  
TO US TODAY.  
A POSTAL  
WILL  
BRING IT.





## The BROOKS EDGE GRIP COLD TIRE SETTERS

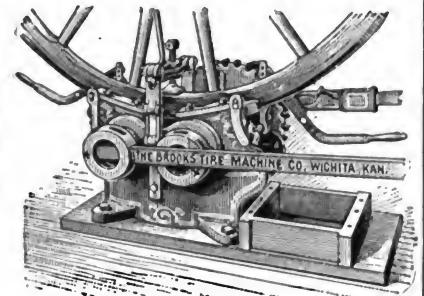
Set all sizes of tires up to 4 by  $\frac{3}{4}$  inches by compressing the metal in a short space. It is not necessary to remove the bolts. It will do the work in from two to five minutes and will make the tire just as tight as you wish and give the wheel the desired dish, with no chance for a miscalculation and a displeased customer. ¶ It is the only machine that has an automatic device for gripping the tire and preventing the keys from slipping on the tire. With all others you have to use a punch and hammer or wrench to accomplish this.



### THE BROOKS

Is built by the oldest manufacturers of edge grip cold tire setters in the United States and our latest improved machine is the result of our long experience.

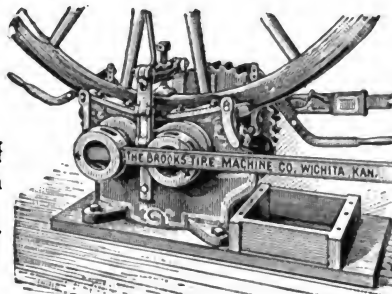
It far exceeds anything ever built in the cold tire setter line.



### THE UNITED STATES

Government has recognized the merits of the Brooks and stamped its approval on them by buying them for its shops.

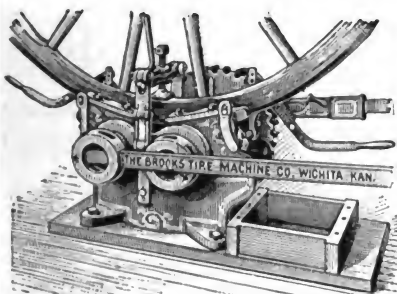
No stronger evidence of the superiority of the Brooks over others could be given.



### NO HIGHER AWARD

Has ever been granted a cold tire setter, including the large expensive factory machines, than was awarded the Brooks by the Jury of Awards at the World's Fair.

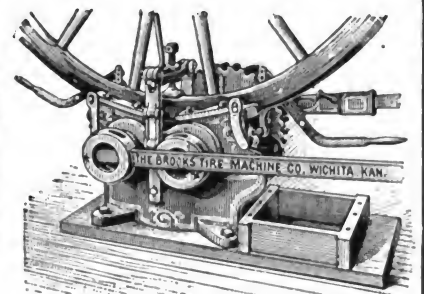
Our claims are based on facts supported by the best authority.



### One of Hundreds of Similar Letters.

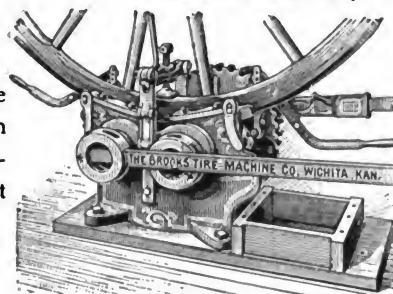
The Brooks Tire Mch. Co., July 12, 1905.  
Gentlemen:—We have been using your cold tire setter over two years and to say that we and our patrons are well pleased is putting it mildly. Our machine has brought us tire setting from fifteen miles around, and when we get the tire setting we invariably get some shoeing and wagon repair work with it. We make as much as \$20.00 per day with the machine alone. We cannot see how we managed to run a shop before we got it. We defy any man to find one of our customers who has had his tires set on our machine that is not perfectly satisfied with it.

Yours truly,  
Williams & Russell, Barry, Texas.



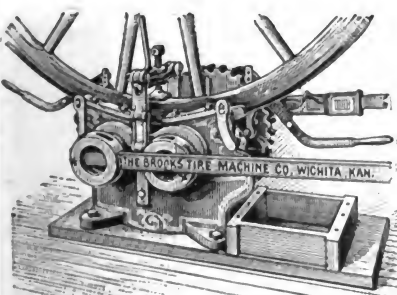
### THE BROOKS

Will set more tires in the same length of time with less labor and earn more money than any other hand power machine on the market. You get the machine and it will get the business.



### THE BROOKS

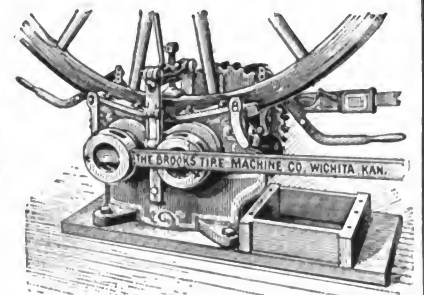
Will soon be setting the majority of the tires in your locality. Why not bring this work to your shop by being the first one to purchase a Brooks? Its work pleases the customers.



### THE BROOKS

Will greatly increase your list of customers with a big increase in your income. You cannot make a more profitable investment.

*It is fully warranted.  
It is shipped on trial.  
It is sold on easy payments.*



Write us today for our special offer and a copy of our popular three color cover booklet, which is sent free and which every blacksmith should have. We will also send you one of our handy vest pocket memorandum books, together with a descriptive circular, prices and liberal terms. DO IT NOW.

**THE BROOKS TIRE MACHINE COMPANY,**  
121 N. Water St., WICHITA, KANSAS.

# DRYDEN'S HIGH GRADE HOOF PADS

MADE OF NEW RUBBER.

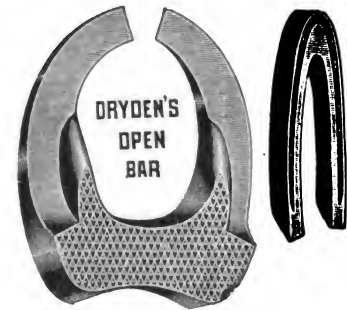


**Leather Back**  
**Black Rubber**  
**Medium and Heavy**  
*Ask Your Dealer*  
*for Them.*



**We make Eighteen**  
**Different Styles.**

**Send for Booklet**

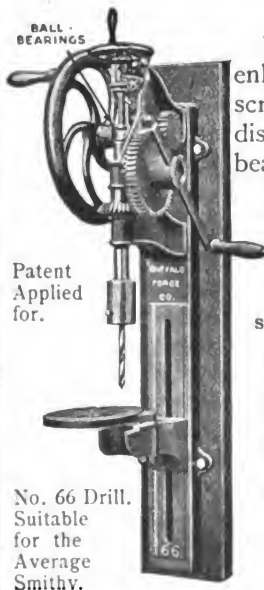


**Dryden Hoof Pad Co., Chicago, Ill.**

## BUFFALO BALL BEARING DRILLS

WITH PATENT BUFFALO SPINDLE-HEAD BALL BEARINGS  
 PUT AT THE POINT WHERE THE GREATEST  
 WEAR AND FRICTION COME.

**T**HEY run with *one half the effort required with any drill of like capacity.* They will do work *beyond the power of any other hand drill.* They will *outwear any drill on the market.* No Friction, No wear. No back lash or lost motion. No brass connection nuts or soft metal bearings to be renewed.



This cut shows the enlarged end of feed screw with ball case, disconnecting key and bearings.



*Here is the greatest difference in speed.*  
*Here is the heaviest pressure.*  
*Here are the ball bearings.*

### A Lever Feed with Three Distinct Features.

Buffalo No. 90 Ball Bearing Drills are equipped with Lever Feed as shown in Cut. It has the following Three Distinct and Original features:

- FIRST** It is made from a *single piece of heavy forged steel.* No fittings, light castings or projecting parts to be bent or broken.
- SECOND** It can be *instantly snapped in position* by inserting a pin and as quickly removed.
- THIRD** It is *entirely separate* from drill and *complete in itself.* It leaves no projections or fixtures to interfere with the ordinary use of drill when removed.

Send for circular.

**BUFFALO FORGE CO., Buffalo, N. Y.**

Canadian Buffalo Forge Co., Ltd., Montreal.



## NOT A MOMENT'S TROUBLE.

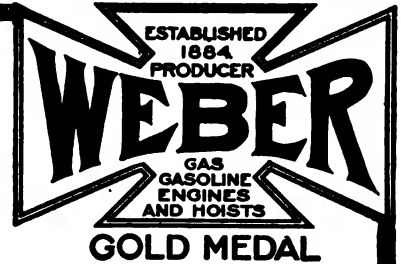
BEAVER CROSSING, NEB.—Will say in regard to my 6 H. P. Engine bought of you last November, I am running a general blacksmith and repair shop and use my engine a great deal. I run a Trip Hammer and Emery Wheel and a large Press Drill and Disc Sharpener, and have power enough to run three times that amount of machinery. I have run my engine over 15 hours by the watch on 5 gallons of gasoline. I have never turned a nut or bolt on my engine yet and it is in perfect condition and has never given me one second's trouble.

For simplicity I don't think it can be excelled in any way. Every one who sees it says it is the most perfect and smoothest running engine they ever saw. Would say if I were going to buy again would have nothing else and would advise anyone wanting to buy a 6 H. P. engine to buy one of your 6 H. P. engines as he could not make a mistake in doing so.

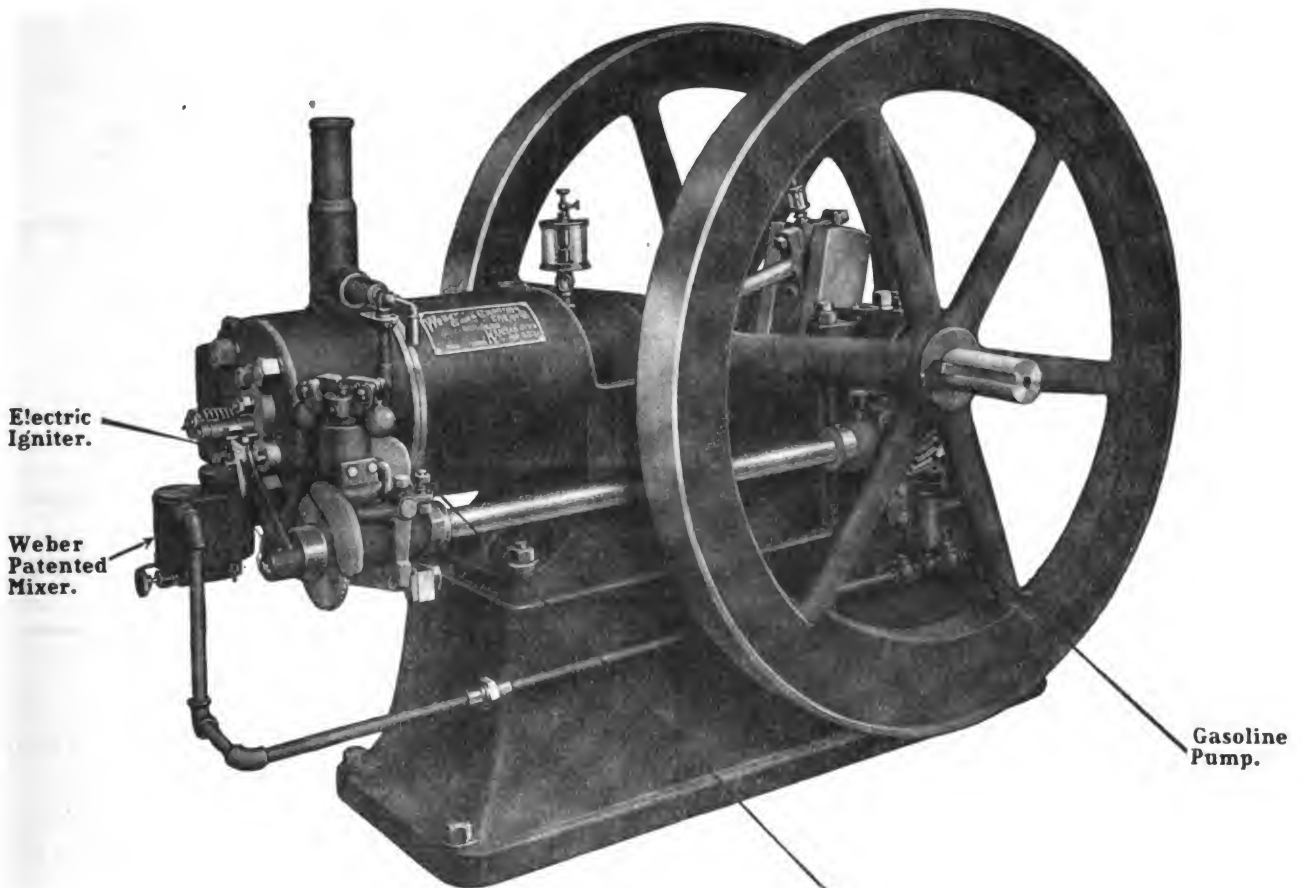
Very respectfully yours,

J. H. McCORD.

HIGHEST AWARD

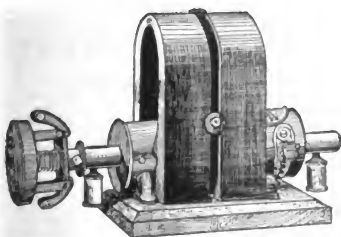


We build WEBER PAT, suction Gas Producers and Gas Engines up to 1000 H. P. Run on coal. Burn 1 lb. per Horse Power Hour. Cost 1-4 cent.



By turning this Nut, speed may be increased or Decreased while Engine is running.

A Weber Pat. Tubular Magneto will save its cost in a few weeks. Replaces batteries entirely, and your engine will give more power and run better.



## NOTICE THE MECHANICAL SUPERIORITY OF THE WEBER ENGINE OVER ALL OTHERS.

The efficient vapor mixer and high speed sensitive governors are two of the reasons why all WEBER ENGINES use less fuel and run steadier than any other make.

## WEBER GAS & GASOLINE ENGINE CO.,

P. O. BOX V 1,114, KANSAS CITY, MO.

Write for complete catalogue.

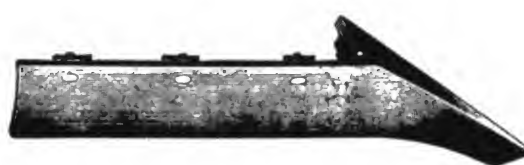
NEW YORK OFFICES, 116 LIBERTY ST., NEW YORK, N Y.

# SOME OF OUR BARGAINS

## HAYSLE FTTED PLOW SHARES.



FITTED WITH  
BOLTS READY  
TO BOLT ON  
THE PLOW.



We carry these **Fitted Shares** for all the leading plows in use throughout the country. **Exact duplicates of the original.** Made from highest, grades of **crucible and soft center steel, thoroughly finished, correctly fitted and ready to apply.** We are now manufacturing about one hundred different numbers and adding new ones constantly.

Special plowshares made to order, any quality or style. Send for estimates.

These shares are **guaranteed** to fit the plows for which they are **intended wherever the shares made by the plow company will fit.**

**Soft center steel is not guaranteed against breakage.**

<b>Bement.</b> No. BG—14 in.	<b>Defiance.</b> No. 97—14 in. No. 92—16 in.	<b>Fuller &amp; Johnson.</b> No. 16X—16 in. No. 14X—14 in.	<b>J. Thompson &amp; Son.</b> No. 16T—14 in. No. 16T—16 in.	No. T9—9 in. No. T10—10 in. No. T12—12 in. No. T14—14 in. No. F. D. 9—15 in. No. F. D. 11—16 in. No. H116—16 in. No. D10—16 in. No. FD18—18 in. No. FALDI—14 in. <i>Alfalfa.</i> No. FALDI—16 in. <i>Alfalfa.</i>	<b>Bradley.</b> No. L33—12 in. No. L45—14 in. No. L70—16 in.
<b>Canton.</b> No. 50—10 in. No. 110—16 in. No. 42A—14 in. No. 46—12 in. No. 54A—16 in. No. 112—14 in. No. 66—12 in. No. 128—14 in. No. 62—9 in. No. 64—10 in.	<b>Deere.</b> No. 13—12 in. No. 31—12 in. No. 33—14 in. No. P33—14 in. No. 42—14 in. No. 46—16 in. No. 037—9 in. No. 049—10 in. No. 038—11 in. No. 059—12 in. No. 40—16 in.	<b>Kingman.</b> No. A16—16 in. No. S314—14 in. No. S316—16 in.	<b>Oliver.</b> No. Crescent 8—16 in. No. Crescent 8—14 in. No. 7—12 in. No. ND1—12 in. No. ND2—14 in.	No. F. D. 11—16 in. No. H116—16 in. No. D10—16 in. No. FD18—18 in. No. FALDI—14 in. <i>Alfalfa.</i> No. FALDI—16 in. <i>Alfalfa.</i> <b>Solid Comfort.</b> No. 134—14 in. No. 138—16 in.	<b>Reliance.</b> <b>Janesville.</b> No. 3R—16 in. No. 2R—14 in. No. 38—14 in.
<b>Rock Island.</b> No. 40—16 in. No. 30—12 in. No. 32—14 in. No. XI—14 in. No. 38—14 in.	<b>Rider.</b> No. 40—16 in. <b>Walker.</b> No. 40—16 in. <b>Cassaday.</b> No. 517—16 in. No. 515—14 in.	<b>Sattley-Hummer.</b> No. 186—16 in. No. 69—16 in. No. 183—14 in. No. 181—12 in.	<b>Gale.</b> No. A12—12 in. No. A14—14 in. No. A16—16 in.	<b>Peru.</b> No. AL—14 in. No. AL—16 in.	<b>Case.</b> No. AS—12 in. No. AN—12 in. No. AS14L—14 in. No. AS16L—16 in. No. AP—14 in. No. AS—16 in. No. AP—16 in. No. AS—18 in.
		<b>Emerson.</b> No. N14R—14 in. <b>Gang.</b> No. N16R—16 in. <b>Sulky.</b>	<b>Moline.</b> No. FSDI—12 in. No. SDI—12 in. No. FDI—14 in. No. DI—14 in.		

### PRICES.

12-inch Crucible Steel, each.....	\$1.40	Soft Center Steel, each.....	\$1.95
14-inch Crucible Steel, each.....	1.50	Soft Center Steel, each.....	2.20
16-inch Crucible Steel, each.....	1.60	Soft Center Steel, each.....	2.40

## Haysler Blacksmith's Plow Shares.



With heavy upset shin that is unapproachable, the heaviest, smoothest shin in the market; runs way down close to point;

no double shin shares are needed. See illustration. Upper corner is filled full and

smooth. New improved and best shape. They are all drawn under a triphammer, refining the grain of steel along the cutting edge, giving added wear and absolute satisfaction. Made from high-grade crucible steel, solid cast and genuine laid soft center steel. We carry both right and left hand and in following sizes.

### Narrow Stirring Plow Shares.

	Solid Cast.	Crucible.	Soft Center.
10 in. 5 1/2 inches wide, each.....	\$.42	\$.53	\$1.20
11 " 5 1/2 " " ".....	.42	.58	1.20
12 " 5 1/2 " " ".....	.45	.58	1.20
14 " 6 " " ".....	.55	.65	1.85
16 " 6 " " ".....	.65	.75	1.50
18 " 6 " " ".....	.85	1.00	1.75

### Wide Stirring Plow Shares.

	Solid Cast	Crucible.	Soft Center.
12 in. 6 inches wide, each.....	\$.48	\$.58	\$1.20
14 in. 6 1/2 " " ".....	.58	.70	1.85
16 in. 6 1/2 " " ".....	.68	.80	1.50
18 in. 6 1/2 " " ".....	.90	1.10	1.75

### Plain Breaker Shares.

	Solid Cast Steel.	Soft Center Steel.
12 in. 6 1/2 inches wide, each.....	\$.60	\$1.80
14 in. 6 1/2 " " ".....	.70	1.50
16 in. 6 1/2 " " ".....	.80	1.75
18 in. 6 1/2 " " ".....	1.00	1.95

We can also furnish Rod breaker shares on any of the above sizes made of 5-16 inch steel, by shipping from factory direct. If in need of anything not listed above, kindly write us.

**Our No. 63 Bargain Catalogue containing 180 pages of rock bottom prices on every kind of plow goods and blacksmiths' supplies is now ready for YOU. It's free.**

**Write for one today.**

# HAYSLE IRON COMPANY

## KANSAS CITY, MO.



# NW

FIND "NW" ON THE NAILS YOU USE  
THE MARK OF QUALITY

## NORTHWESTERN HORSE NAILS

Are now being used by the great majority of up-to-date Horse Shoers throughout the Country. Once used, you will use no other make — satisfaction to all. For Strength, Safety, and Quality of Material, they have no equal on

earth. The Most Perfect in Form and Finish. The Re-enforced Point makes it the Easiest Nail to Drive and the Safest Nail to Use. Will hold a shoe longer than any other Nail on the market. Northwestern Horse Nails are made of the best Swedish Iron and every care is taken in manufacturing them.

TO the thousands of Horseshoers who number among our steady patrons, and likewise to the trade in general, we wish to say that during the year of 1906 the same High Standard of Quality will be maintained in the making of these Nails.

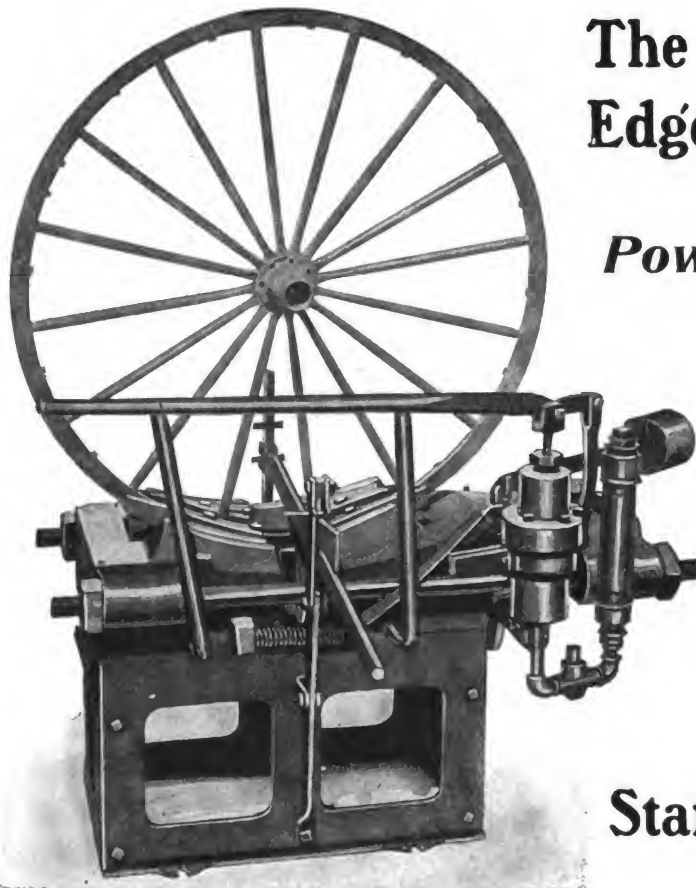



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# UNION HORSE NAIL COMPANY

SOLE MANUFACTURERS

## CHICAGO, ILL.



## The Scientific, Hydraulic Edge Grip Cold Tire Setter

Sets tires cold by a few strokes of a

**Powerful Hydraulic Pump**

### The Warranty Tells the Tale.

It is warranted to work as well in every respect, or better, than any other edge griptire setter and in addition is warranted to work much

### EASIER AND QUICKER.

These are two most valuable points in a hand power cold tire setter.

Its gripping jaws grip the tires accurately and let go quickly without the use of hammer.

HUMBOLDT, NEBR., Oct. 14, 1905.

STANDARD TIRE SETTER CO., Keokuk, Ia.

Dear Sirs: I will write and let you know that your tire setter is giving me the best of satisfaction. We have a tire setter, or rather a "man-killer" here in town and I have tried the machine, but would not have either one of them, if they were given to me. I have shown it to several traveling men and they all say that it is the best machine they ever saw.

Yours respectfully,  
H. V. DORLAND.

For full information, address,

**Standard Tire Setter Co.**  
**KEOKUK, IOWA**

### MR. SHOP OWNER:

This is the hammer you should have on hand as a part of your shop equipment, because she is good at any season of the year.

## KERRIHARD POWER HAMMER

**BUILT RIGHT. RUNS RIGHT. IS RIGHT.**

Designed for the blacksmith shop and built to stand the work. Made after correct lines and embodies correct mechanical principles.

**GET  
CIRCULARS  
AND  
PRICES.**

### 1905 Emery Grinder.

Built for shop work, easy and true running, will last a life time. Been on Market for 15 years. Will take Wheels with 1 1/4-in. hole, 20-in. dia. and 3 in. thick.

**SPECIAL ARBORS  
CAN BE  
FURNISHED EXTRA.**



**Thousands in use  
Get our prices**

**The Kerrihard Company**

**GENERAL FOUNDERS, RED OAK, IA., U. S. A.**

## Buffalo Armor Plate Tools.

Built from a Single Plate of Solid Armor Steel.  
Light, Strong, Indestructible.

Armor Plate Steel, with its extraordinary strength and elasticity, is well adapted to meet the sudden heavy and irregular strains as are set up in this class of tools. Cast iron, having small elasticity, requires a great excess of metal to resist such shocks and provide against the dangerous effects of blow holes, shrinkage strains, etc.

With the exception of stand, all parts of these machines are built of Armor Plate, drop forgings and crucible steel. The powerful levers are so compounded as to give the greatest pressure at the proper point of the stroke. All bearing surfaces are machined and carefully fitted. No lost motion. Jaws of shear are of crucible steel, properly tempered, and will not give at the ends or spring. Edges will not break or "chew" under continual use at their respective ratings. Invaluable for cutting stock, roughing out and trimming work, or punching channels, angle or tee bars.

### Buffalo Combined Punch and Shear No. 3 B.

Punches  $\frac{3}{8}$  inch holes in  $\frac{3}{8}$  inch plate. Shears bars  $\frac{3}{8}$  x 3 or  $\frac{3}{4}$  inch round. Height floor to die, 30 inches. Height over all, 46 inches. Weight, 175 lbs.



Armor Plate  
Punch and Shear  
No. 3 B.

*A complete line of Armor Plate Tools of all capacities and suitable for all uses is illustrated in our Special Catalogue. Get a copy.*



Buffalo Armor Plate  
Punch and Shear  
No. 5.

### Giant No. 5 Punch and Shear.

A heavy duty machine punching  $\frac{3}{4}$  x  $\frac{1}{2}$ , and shearing 6 inch by  $\frac{5}{8}$  inch.

The Buffalo Portable Punch and Shear No. 5 is especially designed for forge shops, boiler works, structural steel shops, or wherever a portable punch and shear with the capacity of a power-driven machine is desirable. No. 5 will shear 6-inch angle iron in two cuts.

Buffalo Armor Plate tools are always ready for use. They operate quietly and easily, are unbreakable, and can be readily shifted to any part of the shop.

CANADIAN BUFFALO FORGE CO., Ltd., Montreal.

*Buffalo Forge Company*  
*Buffalo, N.Y.*

## Earn More Money

### INTERNATIONAL CORRESPONDENCE SCHOOLS

Box 1302, Scranton, Pa.

Please send me your booklet, "1001 Stories of Success," and explain how I can qualify for the position before which I have marked X.

Foreman Blacksmith  
Foreman Machinist  
Foreman Toolmaker  
Foreman Pat'n'm'r  
Foreman Molder  
Mech. Engineer  
Machine Designer  
Mech. Draftsman  
Stationary Engineer  
Electrical Engineer  
Elec. Lighting Supt.  
Elec. Railway Supt.

Electrician  
Architect  
Structural Engineer  
Contractor & Builder  
Foreman Plumber  
Civil Engineer  
Surveyor  
Mining Engineer  
Bookkeeper  
Stenographer  
U.S. Civil Ser. Exams.  
Ad Writer

If the position you wish to gain is not in the list, state what it is here \_\_\_\_\_

Name \_\_\_\_\_

St. & No. \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

## Secure Your Future

To earn more money—to secure your future—to succeed in life—cut out, fill in, and mail to the International Correspondence Schools the above coupon. They will show you how you can fit yourself easily and quickly in your spare time to get more money in your present position or change to a more congenial and better-paying occupation.

Mind, the sending of this coupon does not oblige you to pay one cent. It simply gives the I. C. S. the opportunity of proving how easy it is for you to improve your condition right at home without neglecting your present work. No risk to run. No books to buy.

The I. C. S. is an institution with an invested capital of over \$5,000,000, and a reputation of 14 years' successful work. It has taken an apprentice foundryman and qualified him as a mechanical expert at a salary of \$2,500 yearly. It has taken a miner and enabled him to become a mine inspector with a salary of \$3,000 a year. It has taken an apprentice and fitted him for the position of railroad master mechanic with a salary of \$2,500 a year. It has taken tens of thousands of men and women of every age and in every walk of life, and in a few months qualified them to double, triple, and quadruple their earnings. To learn who they are; how it was done; how YOU can do the same, fill in the coupon and mail it today.

## Succeed in Life

ESTABLISHED 1836

**BEALS & CO.**  
*Iron, Steel  
and Hardware*

Tools and Supplies for Horseshoers  
and General Blacksmiths  
Carriage Hardware and Woodwork

44, 46, 48 & 50 TERRACE, BUFFALO, N. Y.

# The LITTLE GIANT

## Combined PUNCH AND SHEAR

The Most Powerful Lever Punch  
and Shear Made.

This is not a new machine — only a new cut showing the improvements we have lately added — making it more valuable for the blacksmith. It is made in three sizes. No. 1 will punch  $\frac{1}{2}$  in. hole in  $\frac{1}{2}$  in. iron; cuts iron  $\frac{3}{4}$  in. thick and 1 in. round. Weight 500 lbs. No. 2 will punch  $\frac{3}{4}$  in. hole in  $\frac{1}{2}$  in. iron; cuts  $\frac{1}{2}$  in. thick and  $\frac{3}{4}$  in. round. Weight 800 lbs. No. 3 will punch  $1\frac{1}{2}$  in. hole in  $\frac{3}{4}$  in. iron; cuts iron  $\frac{3}{4}$  in. thick and  $\frac{3}{4}$  in. round. Weight 275 lbs. Each machine is equipped with five sets of punches and dies. This machine is made for the blacksmith shop and we DO claim that it is decidedly the best on the market for that place, and can furnish any amount of testimonials to that effect.

Price No. 1, . . . \$50.00 net.  
" No. 2, . . . 40.00 "  
" No. 3, . . . 30.00 "



## OUR 1906 EMERY GRINDER

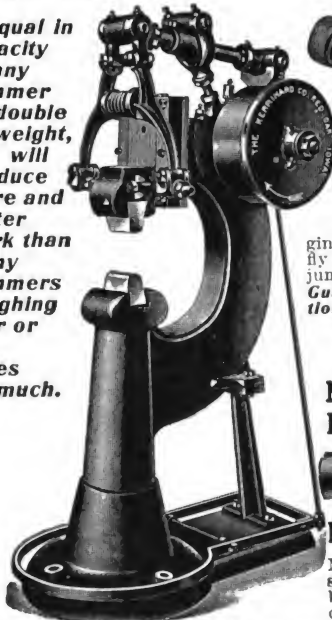
Meets the demand for a comparatively cheap but handy floor grinder. Will carry wheels 20 inches in diameter and 3 inches thick or smaller with  $1\frac{1}{4}$  hole. Strongly built for long and hard service. Steady and true running. Write for particulars. With rests, \$16.00 Without rests, 13.50



Write for interesting and descriptive circulars and price list. Sent free upon request. Write us today. With every machine we send a neat wrench for removing the bolts and nuts, a feature not found with other Grinders.

## THIS HAMMER

Is equal in capacity to any hammer of double its weight, and will produce more and better work than many hammers weighing four or five times as much.



Height over all . . . 55 inches  
Floor Space . . . 18x30 inches  
Height to top of anvil block, 31 inches  
Weight, . . . 700 pounds  
Price. . . . \$80.00



To Gas Engine Operators.

Dynamo Ignition,

## Motsinger Auto-Sparker.

No battery to start or run. The original speed-controlled friction-drive Dynamo. Driven parallel with engine shaft. No belts. No beveled pulley or beveled fly wheel necessary. For make and break and jump-spark system. Water and dust proof. Fully Guaranteed. We have an attractive proposition for the dealer in Gas Engine lines.

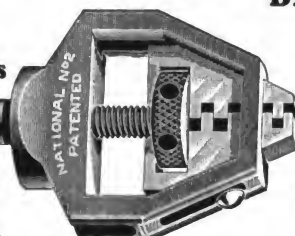
Correspondence Solicited. Price . . . \$20.00

## National Blacksmith's

## Drill Chuck.

Made entirely of steel, especially for blacksmithing and carriage work. Positive, strong and self-cleaning. Casts no shadows. Will save cost over other chucks in the saving of time. Money refunded if not as represented. Ask your jobber for it or send direct or prices and circulars. The best is the cheapest.

No. 15, Holding 0 to  $\frac{3}{4}$  . . . \$3.50  
No. 16, Holding 0 to  $\frac{1}{2}$  . . . 4.25



## The Royal

## WESTERN CHIEF BLOWER

IS  
A

## GOOD BLOWER

\$16.00  
Each.



## The Campbell Iron Co.

Carry Complete Line of Horseshoer's Supplies, Wagon and Carriage Material.

Western Agt. for DITZLER COLORS IN JAPAN.

Write us your requirements for

## Gas and Gasolene Engines, Shaftings, Pulleys and Fixtures.

We Sell all the Leading Makes of Power Hammers, Band Saws, and Other Tools Required in an Up-to-date Blacksmith and Wagon Shop.

## The Campbell Iron Co.

ST. LOUIS, MO.

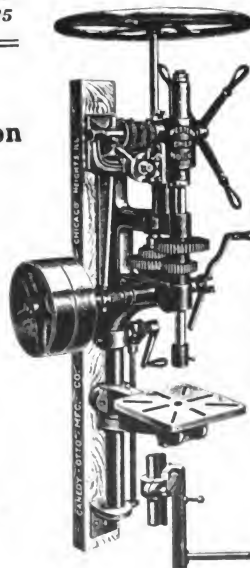
## Western Chief No. 16.

All gears cut fast and slow speed, instant change.

Drills to center of 24 in. circle; bores from 0 to  $1\frac{1}{2}$  in. Spindle runs up and down  $8\frac{1}{2}$  inches. Table has up and down run  $16\frac{1}{2}$  inches. Weight, 360 lbs.

Prices:

Hand Power . . . \$32.00  
With Pulleys . . . 34.00  
Wheel Holder Attachment \$2.00 extra.





**Capewell**  
**HORSE NAILS**

J. H. C. LITTLE  
J. H. C. LITTLE  
J. H. C. LITTLE

A. W. WILLIAMS  
A. W. WILLIAMS  
A. W. WILLIAMS

THE CAPEWELL HORSE NAIL CO.  
HARTFORD, CONN. U.S.A.

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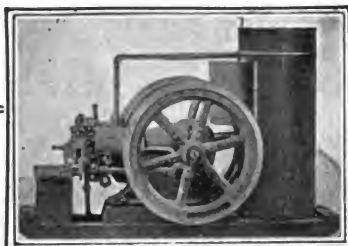
SUMMARY

1906	JANUARY							1906
SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.		
1	2	3	4	5	6			
7	8	9	10	11	12	13		
14	15	16	17	18	19	20		
21	22	23	24	25	26	27		
28	29	30	31	1st FULL M.	1st LAST Q.	2nd NEW M.		

MADE IN U.S.A.

The above Calendar, printed in colors on a card 14 x 20 inches,  
will be sent, postpaid, to any part of the world,  
upon request addressed to

**THE CAPEWELL HORSE NAIL COMPANY**  
Hartford, Conn., U. S. A.



### Designed for the Blacksmith. Our 4 H.P. Engine

Fills every shop requirement and is always ready for business. Giving perfect satisfaction to hundreds of shop owners. Simple, strong, substantial. Best material and finest workmanship. Write for our Catalogue. Sent free for the asking. ROCKFORD ENGINE WORKS, Rockford, Ill.

## STARRETT TOOLS

THE STANDARD FOR

ACCURACY, DESIGN, WORKMANSHIP, FINISH,

L. S. Starrett says:

"If you find any better tools than Starrett Tools—buy them."

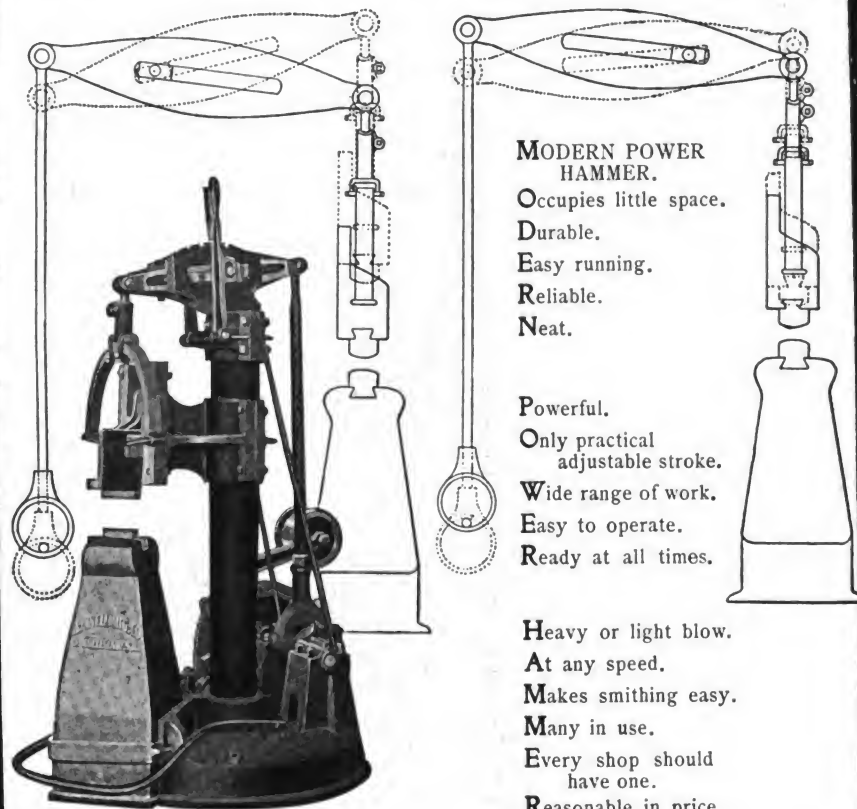
## HACK SAWS



STARRETT QUALITY.

Complete Catalogue No. 17 A.H. sent on request. You ought to have it.

THE L. S. STARRETT CO.,  
ATHOL, MASS., U. S. A.



### MODERN POWER HAMMER.

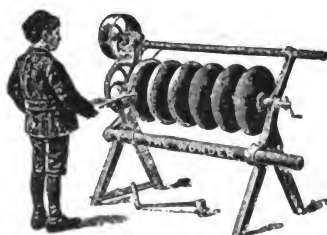
Occupies little space.  
Durable.  
Easy running.  
Reliable.  
Neat.

Powerful.  
Only practical adjustable stroke.  
Wide range of work.  
Easy to operate.  
Ready at all times.

Heavy or light blow.  
At any speed.  
Makes smithing easy.  
Many in use.  
Every shop should have one.  
Reasonable in price.

GRINNELL MFG. CO., GRINNELL, IOWA.

# THE WONDER DISC SHARPENERS



THE LITTLE WONDER.

BUY

## THE WONDER DISC SHARPENERS

Why spend your money for an old, out-of-date machine, when you can buy the latest, simplest, neatest, and Best Constructed Machines on the market at the same price?

WHY BUY THE WONDER? BECAUSE THE WONDERS are the only machines adjustable to all conditions.

Can shear any part of edge to any bevel.  
Can shear back from edge as far as required.

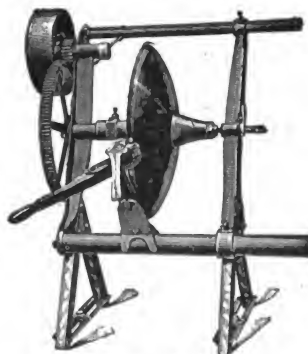
Can use tool on either side of disc.

Can shift from one disc to another.

Can do all this without the turn of a set screw or nut; is a positive feed; automatically adjusts itself to wobbling or bent discs; knives made of best grade, self-tempering steel, will last a life time for hand and power.

FULLY WARRANTED. We pay the freight both ways if not as represented.

The LITTLE WONDER will sharpen any size disc up to 22 inches in diameter. The accompanying cut shows the LITTLE WONDER at work on a whole section of discs. This machine is especially adapted for sharpening Disc Harrows and rolling Coulters.



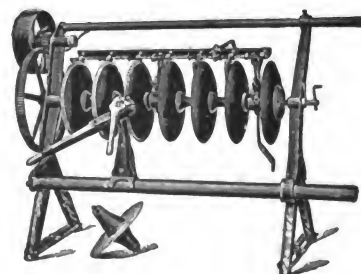
THE GIANT WONDER.

The above cut shows the GIANT WONDER at work on Disc Plows. Will sharpen any size from twelve to thirty-two inches in diameter.

Write to us direct if your dealer cannot supply you giving us his name and address. Send for circulars. Manufactured by

For Sale by Leading Dealers in U. S. and Canada.

The GIANT WONDER is a larger and heavier machine; has holder attachments for rolling coulters and disc plows; will take in discs up to 32 inches in diameter; is a geared machine and will also take in disc harrow sections same as the Little Wonder and do the work equally as well. The only machine on the market with these advantages.



The above cut shows the GIANT WONDER at work on a Seven Disc section without removing Discs thereby saving one-half the time and labor as in many cases you could sharpen a whole section of Discs while your competitor is taking his off the shaft, the old-fashioned way.

ASK YOUR DEALER FOR PRICES.

A. E. DURNER, Evansville, Wis.

# Our Goods for Your Cash.

## Our New Leader Sarven Wheels.

THEY HAVE NO EQUAL FOR THE MONEY.

These wheels are the best ever offered for the money. They are not high quality, like our A,B,C and D grades, and we do not warrant them as such. They are made of good forest hickory timber, thoroughly seasoned, and are put together with as much care as the better grades. They are all right for repair work, and are used by some on very cheap new work.

Prices below are for sets of four wheels with steel tire on.

### PRICE CASH WITH ORDER.

Cat. No.	Spoke	Hub	Tire	Height	Price
7c	1	6 1/2	3/4 x 1 1/2	8-3 1/2 8-3 1/2 8-3 1/2	\$5 88
8c	1 1/2	6 3/4	1 x 1 1/2	8-3 1/2 8-3 1/2 8-3 1/2	5 74
9c	1 1/2	6 3/4	1 x 1 1/2	8-3 1/2 8-3 1/2 8-3 1/2	5 97
10c	1 1/2	7	1 1/4 x 1 1/2	8-3 1/2 8-3 1/2 8-3 1/2	7 88
11c	1 1/2	7 1/2	1 1/4 x 1 1/2	8-3 1/2 8-3 1/2 8-3 1/2	9 00

We positively will not make these wheels in any other sizes than listed above.

We charge 25 cents extra where single wheel is ordered.

These wheels are always in stock and we will ship on same day order is received.

## High Quality Sarven Wheels.

WARRANTED.

These prices are for Set of Four Wheels without Tire.

Light Buggy, Surrey and Light Spring Wagon Sizes.

### PRICE CASH WITH ORDER.

Cat. No.	No. of Flange	Spoke	Hub	Rim	Price per Set, Without Tire				Add for Tire Put On
					A	B	C	D	
18c	01	1 1/2	6 1/2	3/4 x 1 1/2	\$8 47	\$6 66	\$5 84	\$4 88	3/4 x 1 1/2 \$1 54
20c	01	1 1/2	6 3/4	3/4 x 1 1/2	8 58	6 77	5 46	4 50	3/4 x 1 1/2 1 66
22c	01	1 1/2	6 3/4	3/4 x 1 1/2	8 69	6 88	5 58	4 63	3/4 x 1 1/2 1 78
24c	01	1 1/2	6 3/4	3/4 x 1 1/2	8 79	7 00	5 70	4 75	3/4 x 1 1/2 1 90
26c	01	1 1/2	6 3/4	3/4 x 1 1/2	8 91	7 56	6 19	5 38	3/4 x 1 1/2 2 61
28c	01	1 1/2	6 3/4	3/4 x 1 1/2	9 03	7 67	6 41	5 50	3/4 x 1 1/2 2 61
30c	01	1 1/2	6 3/4	3/4 x 1 1/2	11 28	9 08	7 60	6 50	3/4 x 1 1/2 2 99

The Maximum Height of Wheels, with 1 1/2 inch spoke and under, in sets, 4 feet and 4 feet 4 inches; in pairs, 4 feet 2 inches; for all wheels ordered in excess of the maximum height, a charge will be made of 3 per cent additional to the above list for each inch or fraction thereof, up to and including 4 feet 4 inches.

\$1.50 per set added to the list on Sarven Wheels with 1 1/2 inch spoke and under, when wheels are ordered with 18 spokes. **Single wheels 25 cents NET extra.**

The above sizes are all made with the solid flange forming Point Band on front, and Back Band on rear of hub. We will paint them in good style for \$2.00 per set; not striped unless so ordered. If color is not given, we will paint wheels black.

We will insert screws in Rims at the following prices:

Wheels, 1 1/2 Thread and under, per set . . . . . \$ .29  
Wheels, 1 1/2 Thread . . . . . \$ .36

## X Grade of Sarven Wheel.

These Wheels Are Not Warranted, But Are Made From Good stock and Are Equal to the "D" Grade of Many Manufacturers.

THESE WHEELS ARE MADE IN THE FOLLOWING SIZES, AND OF ANY HEIGHT DESIRED.

GRADE X.

### PRICE, CASH WITH ORDER.

Cat. No.	Spoke	Hub	Rim	Price per Set, Without Tire	Add for Tire Put On
12c	1 1/2	6 1/2	3/4 x 1 1/2	\$4 18	3/4 x 1 1/2 \$1 54
13c	1 1/2	6 3/4	3/4 x 1 1/2	4 25	3/4 x 1 1/2 1 66
14c	1 1/2	6 3/4	3/4 x 1 1/2	4 88	3/4 x 1 1/2 1 78
15c	1 1/2	6 3/4	3/4 x 1 1/2	4 50	3/4 x 1 1/2 1 90
16c	1 1/2	7	3/4 x 1 1/2	5 25	3/4 x 1 1/2 2 61
17c	1 1/2	7 1/2	3/4 x 1 1/2	6 25	3/4 x 1 1/2 2 90

We charge 25c extra where single wheel is ordered.

## High Quality Sarven Wheels.

WARRANTED.

These prices are for a Set of Four Wheels without Tire

For Medium and Heavy Spring Wagons and Trucks.

### PRICE, CASH WITH ORDER.

Cat. No.	No. of Flange	Spoke	Hub	Rim	Price per Set Without Tire				Add for Tire Put On
					A	B	C	D	
25c	17	1 1/2	7 1/2	1 1/2 x 1 1/2	\$18 86	\$15 96	\$12 96	\$10 26	1 1/2 x 1 1/2 \$4 51
26c	21	1 1/2	8	1 1/2 x 1 1/2	19 44	16 74	14 04	10 80	1 1/2 x 1 1/2 7 56
27c	28	1 1/2	8 1/2	1 1/2 x 1 1/2	21 80	18 90	15 66	12 15	1 1/2 x 1 1/2 10 80
28c	35	1 1/2	8 1/2 to 9 1/2	1 1/2 x 2 1/2	29 64	25 94	21 57	16 67	1 1/2 x 2 1/2 12 90
29c	45	1 1/2	9 to 11	1 1/2 x 2 1/2	32 40	29 08	24 70	18 76	1 1/2 x 2 1/2 14 70
30c	49	2	10 to 11	2 x 2 1/2	37 55	32 40	28 41	22 28	2 x 2 1/2 15 90
31c	51	2 1/2	10 to 11	2 1/2 x 2 1/2	40 72	35 82	31 49	24 70	2 1/2 x 2 1/2 16 50
32c	57	2 1/2	10 to 11	2 1/2 x 2 1/2	44 46	39 52	34 58	27 79	2 1/2 x 2 1/2 16 50
33c	63	2 1/2	11 to 12	2 1/2 x 3	48 17	44 46	37 67	30 89	2 1/2 x 3 17 10
34c	71	2 1/2	11 to 13	2 1/2 x 3	51 57	48 17	40 96	33 64	2 1/2 x 3 17 10
35c	73	2 1/2	12 to 14	2 1/2 x 3 1/2	57 43	53 12	46 45	38 45	2 1/2 x 3 17 10
36c	79	2 1/2	12 to 14	2 1/2 x 3 1/2	60 52	57 43	48 17	40 96	2 1/2 x 3 17 10
37c	85	2 1/2	12 to 14	2 1/2 x 3 1/2	64 84	61 14	52 49	44 81	2 1/2 x 3 18 00
38c	95	3	12 to 16	3 x 3 1/2	69 16	65 46	56 81	48 17	3 x 3 18 00
39c	105	3 1/2	12 to 16	3 1/2 x 3 1/2	79 04	75 44	66 81	52 49	3 1/2 x 3 20 40

The Maximum Height of Wheels, with 1 1/2 inch spoke and over, in sets, 4 ft. and 4 ft. 8 in.; in pairs, 4 ft. 6 in.; for all wheels ordered in excess of the maximum height, a charge will be made of 3 per cent additional to the above list for each inch or fraction thereof, up to and including 5 ft. 2 in.

Wheels with 1 1/2 inch spoke and heavier are made with oak spokes.

For wheels ordered with width or depth of rim exceeding sizes given in list, an additional charge will be made of 2 per cent. per set for each one fourth inch or fraction thereof.

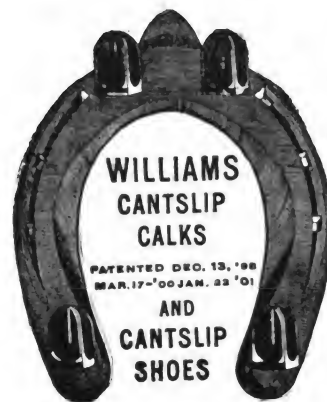
We charge 10c. extra where single wheel is ordered.

### We Will Insert Rivets in Rims at Following Prices:

Wheels with 1 1/2 tread and smaller . . . . . Per Set \$ .88  
Wheels with 1 1/2 and 1 1/2 tread . . . . . Per Set .88  
Wheels with 1 1/2, 1 1/2 and 2 tread . . . . . Per Set 1.00  
Wheels with 2 and 2 1/2 tread . . . . . Per Set 1.25  
Wheels with 2 1/2 tread . . . . . Per Set 1.50  
Wheels with 2 1/2 to 3 . . . . . Per Set 1.75  
Wheels with 3 1/2 to 3 1/2 tread . . . . . Per Set 2.00  
Wheels with 3 1/2 to 4 . . . . . Per Set 2.25

**Muncie Wheel & Jobbing Co., Muncie, Ind.**

# Some Interesting Facts about CANTSLIP CALKS



**I**N LOOKING over the advertising of the different manufacturers of removable Calks, you will note that they all lay claim to having the best calk on the market, and undoubtedly they are honest in their belief.

"The proof of the pudding is in the eating" as also the superiority of removable Calks is in the using. As every successful blacksmith aims to please his customers, it should be his duty to get samples of different calks and then allow his judgment of the requisites necessary for a removable calk that will be satisfactory under all conditions, to decide what make of calks he should supply his customers.

As no one style of calk will be satisfactory under all conditions we make four styles, and in looking over same your good judgment should show you the calk that meets the requirements for your territory.

The following illustrations and short description will undoubtedly assist you, but if not, we would be pleased to send you sample calks on request.



A  
Cant Slip

The original Cant Slip Calk, often imitated, but not successfully. This Calk is designed for use on city pavements and hard roads, and you will note from its peculiar construction has four points or blades, which will remain sharp until entire calk is worn out.



B  
Steel Center

In our Hard Steel Center Calk, we offer you a calk that is really superior to other calks of this style manufactured. The steel center runs entire length of calk and being encased with softer metal, insures perfect uniformity of shape, and will continue to wear sharper with use.



C  
Solid Steel

Is specially designed for use on snow and ice covered roads, and, on account of its form and penetrating properties, has proven a complete success.



D  
Mud

Our Mud Calk is designed for use where sharp calks are not required, and on account of its wearing surface will give excellent service,

**Remember We only sell to the Blacksmith.**

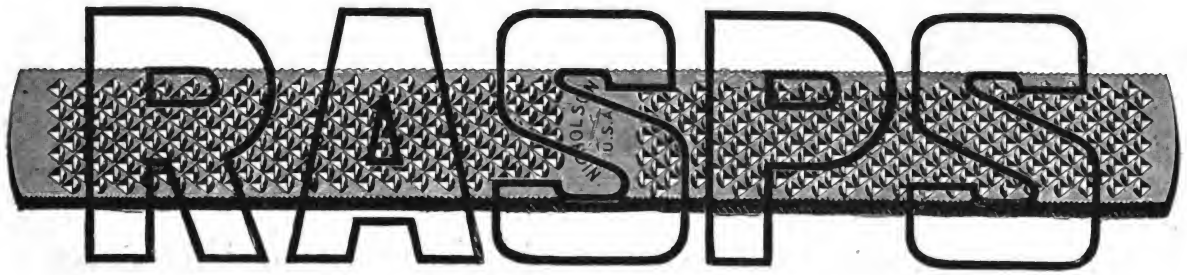
If your dealer does not handle "CANT SLIP" write us direct.

Dealers in Everything  
for the Blacksmith and  
Wagonmaker.

**Bittenbender & Co.**  
Scranton, Pa.

**Sole  
Distributors.**





**NICHOLSON.** 

**KEARNEY & FOOT.**



**ARCADE.** 

**AMERICAN.** 

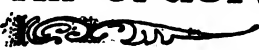
These  
well known  
**FACTORY  
BRANDS**

are made and  
guaranteed by us.

**GREAT WESTERN.**

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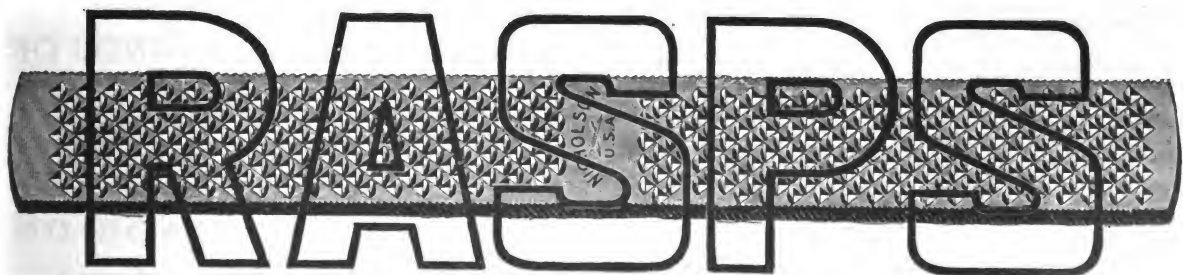
**J.B. SMITH.** 

Carried in stock at  
our various factories  
in **AMPLE QUANTITIES**  
to enable us at all times  
to promptly fill orders  
of any size. 

**EAGLE.** 



**NICHOLSON FILE CO.,**  
**PROVIDENCE, R. I., U. S. A.**





## START THE NEW YEAR RIGHT

AND PLACE YOUR ORDERS FOR

# United States Shoes

"THEY ARE IN A CLASS BY THEMSELVES"

*Made in All Sizes and Patterns*

And the **BEST SHOES** on the Market.

For Sale by All Leading Jobbers.

Write for Catalogue.

**United States Horse Shoe Co.**

**Rolling Mills and Factory, ERIE, PENN.**

Cut out this Coupon and send it to us with your name and address and we will send you a handsome souvenir **STICK PIN FREE.**

**TRADE MARK**  
Registered in U. S. Patent Office



## ROWE Patent Square Shoulder Shoe CALKS

The only Shoe Calk made with Steel Center running the whole length of Calk and welded to the iron.

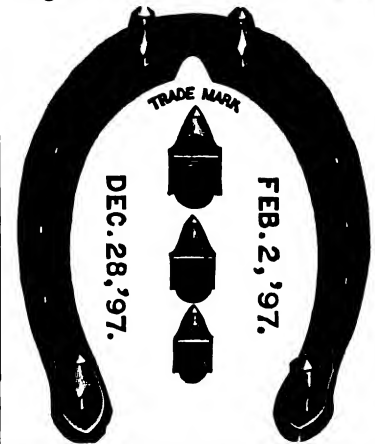
The use of these Calks in the winter season will save you time and money for the following reasons:

1st. The Calks are made with a square base, which effectually prevents their being screwed against the foot by an inexperienced person. 2d. These Calks do not require a special wrench, as the square base allows them to be removed by any forked or monkey wrench. 3d. The base acts as a Pinch Nut, and prevents the Calk from working loose on account of any jar. 4th. The base prevents the shoe from wearing around the Calk, so that it retains its full thickness at all times. 5th. The Calk can be used in machine made shoes with perfect satisfaction, and the first cost will be but a trifle more than in the ordinary way of shoeing. 6th. The Calks are made of hard center in five sizes,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ , and  $\frac{5}{8}$ , both sharp and blunt. 7th. A horse shod with these Calks will travel easier than when shod in the usual manner, and one set of shoes with proper care will last one entire winter. 8th. Owners of horses that are in constant service, (to wit:—Grocery, Express and Hack Horses, will find it to their advantage to use these Calks, especially in the winter.

**ALLEN H. ROWE, Pres't and Treas., 28 SHELDON ST.**

Manufactured by **The Rowe Patent Square Shoulder Shoe Calk Co., Hartford, Conn.**

Registered in U. S. Patent Office



Write for Prices.



MADE ONLY BY

## THE ROYER WHEEL COMPANY

CINCINNATI, OHIO.

Manufacturers of

ALL SIZES AND KINDS OF

## WAGON WHEELS

for the

**WHOLESALE TRADE ONLY**

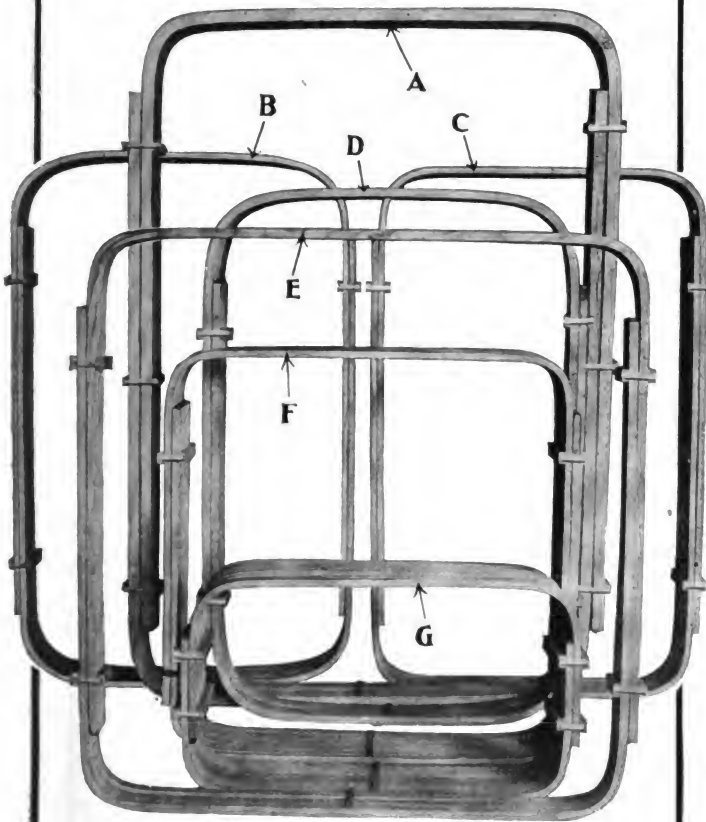
Write us for prices and name of jobber handling our wheels

No more broken points of hubs

No more axle ends or axle nuts exposed

No grease on the outside of hub

- A. Heavy Ice Wagon Bow. D. Victoria Bow.  
 B. Oval Top Express Bow. E. Automobile Bow.  
 C. Flat Top Express Bow. F. Long Buggy Bow.  
 G. Short Buggy Bow.



Write for Catalogue and Prices  
 S. N. BROWN & CO., Dayton, O.

**AIR CUSHION RUBBER HORSE SHOE PADS**

NO LAMENESS  
 PERFECT SAFETY  
 DRIVING OVER ANY  
 STREET PAVEMENT  
 WITH

AS EASY TO  
 THE HORSES  
 A MEADOW  
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PROLONGS  
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 USEFULNESS

ORDER  
 BY  
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NO SLIPPING  
 WILL IN-  
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THE MOST  
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TAKE  
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**REVERE RUBBER CO.**  
 SOLE MANUFACTURERS, BOSTON, MASS.

**JANUARY--1906**

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This Calendar, printed in colors on a card 16 x 22 inches, will be mailed free to anyone who will send his address to

**REVERE RUBBER CO.,**  
**BOSTON, - MASS.**

## Know what I'm talking about

when you say "PIONEER SHAFT ENDS". I've been in the factory and helped make 'em. Honest built from the inside to the outside. At the core, a hard wood stick shaped like the end of a shaft—a heavy steel tube covering that and another tube seamed and locked that fits over the inner one, a double tube the entire length. This double barreled tube extends beyond the wood core, and all you have to do when repairing a broken shaft is to saw it off square and shove it into the open end of the tube, butting it right up against the wood inside—put in the rivet and the job is done.



The outer tube is finished with two coats of fine black enamel, baked on by steam—all the elasticity and lustre of the enamel retained by this process—as fine a finish as any patent leather you ever saw; one of our steel drawn shaft tips, finely nickel plated, to finish the end. Is it strong enough at the joint? Well, if you don't care about marring the finish, jump on it a few times. You've got to break a double steel tube and it will take a few jumps.

The folks have an attractive poster that tells the story at a glance. It would look well in your shop and would help your business. Tell them your address—they'll do the rest.

The "Pioneers" are in stock with almost every dealer in Blacksmiths' supplies and if you don't know where to get them, write

**Crandal, Stone & Company,**  
**BINGHAMTON, N. Y.**

They know.



**SINGAPORE, INDIA.**

**JOHANNESBURG, AFRICA.**

**FREMANTLE, WEST AUSTRALIA.**

Horse Shoers and Horsemen in these, and many other far away points,  
use and know the merits of

# **BOSS RACING PLATES**

**STEEL and ALUMINUM**

**Racing Plate Bars @ B.&M. Ribbed Steel**

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When the Racing Season is on in your locality you will  
**SURELY WANT TO USE THEM.**

If you don't know all about them or our

**IDEAL COUNTERSUNK STEEL SHOES**

== AND ==

**BOSS TOE and SIDE WEIGHTS, etc.**

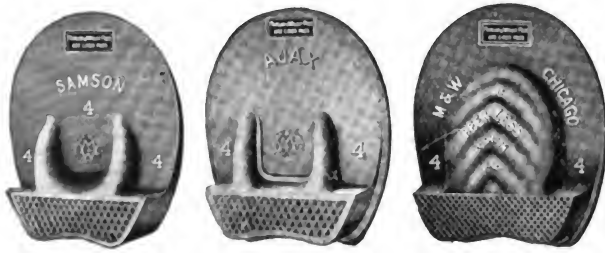
Let us give you more particulars.  
A postal request for printed matter is all that's necessary.

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We make the best **SNOW SHOE** you can buy, too.

**BRYDEN HORSE SHOE COMPANY,  
CATASAUQUA, PA.**





# At ANY Price.

**MORGAN & WRIGHT PADS**  
are the most desirable pads  
on the market.

Strong; well-made; durable; easy to fit; sizes run larger than other brands.

They have proven **from the very first** to be **exceptionally good pads for the horse.**

They have educated hundreds of horse owners to the "sticking point" in the use of pads by **proving** that their use not only saves veterinary bills, but that they **help the horse to do his best.**

They have helped horseshoers everywhere both to **hold** and to **increase** their pad business.

You can't pull "smiths" who use them **away** from them with a Borax 20-mule team.

There's a pad for every purpose—15 in all. Make the test **yourself.**

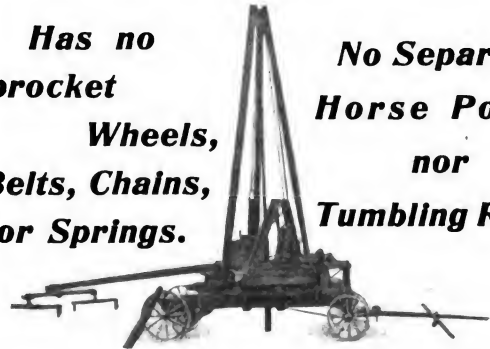
**MORGAN & WRIGHT,**  
**CHICAGO.**



## OUR ROTARY DRILL

*Has no  
Sprocket  
Wheels,  
Belts, Chains,  
or Springs.*

*No Separate  
Horse Power  
nor  
Tumbling Rods.*



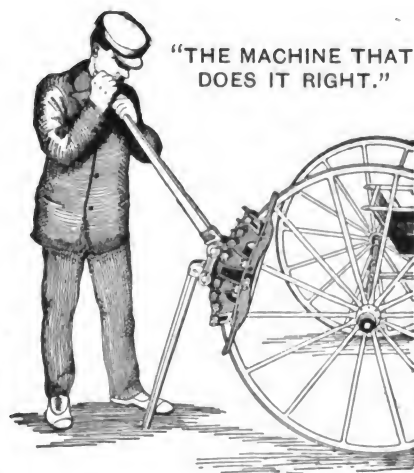
## THE POWER IS DIRECT TO THE MACHINE

It is easy work for one man and one team to drill to the depth of 400 feet. One man and one team can set it up and begin drilling in 10 minutes.

Drill turns its own rope and drill bit never strikes twice in the same place, as drill bar revolves automatically. Will cut from hardest granite to dirt, and excels in quick sand. We carry drill supplies in stock. **WRITE FOR PRICES.**

**Fort Smith Well Drill Mfg. Co.,**  
**FORT SMITH, ARK.**

## SCHAU TIRE SETTER



"THE MACHINE THAT  
DOES IT RIGHT."

3,000  
in use  
in the  
United  
States  
and  
Canada

*Write for Catalogue.*

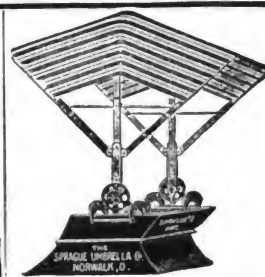
**BURTT MFG. CO.**  
**Kalamazoo, Mich.**



## What COL. SPRAGUE Makes.

Wagon Umbrellas,  
3-Bow Tops,  
Carriage Canopies,  
Auto Tops, Lawn Canopies,

**MADE THE SPRAGUE WAY.**



Send for Catalogues.

THE SPRAGUE UMBRELLA CO., Norwalk, Ohio.

TRADE  
STORM KING  
MARK

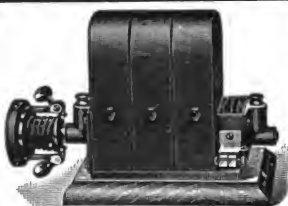
WE ARE THE ORIGINATORS

WE ARE THE ORIGINATORS

TRADE-STORM KING-MARK

Say, Write today for one of our adjustable Storm King Fronts. The price is only \$2.00. Also ask for Catalogue.

DAUGHERTY MFG. CO., Columbus, Ohio.



### HENRICKS MAGNETO

Fires your gas or gasoline engine without the aid of batteries.

It is better and more durable than any Dynamo. Its Governor regulates the speed regardless of speed of Fly Wheel. Its Governor adjusts to imperfect Fly Wheels. Its Governor insures a constant and uniform spark. The spark does not burn the contacts of the engine. All strains are removed from the bearings of Magneto. FULLY GUARANTEED. AGENTS WANTED.

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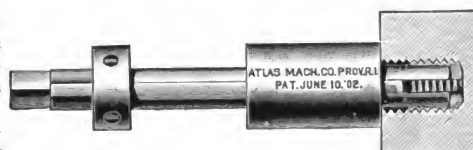
130 S. Capital Avenue

INDIANAPOLIS, IND.

## ATLAS EXTRACTOR OF BROKEN TAPS

A strong and simple device for removing taps broken off in a tapped hole. Works quickly and easily and will not injure the work. A time and money saver; always ready for instant use.

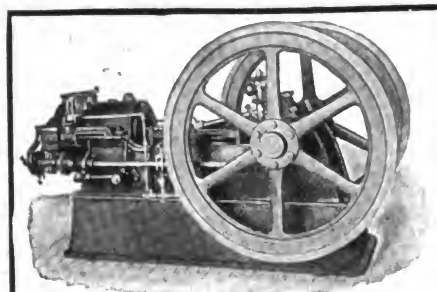
These tools are made in sizes of one-sixteenth from  $\frac{1}{8}$  in. up to and including  $\frac{3}{4}$  in., and in one-eighths from  $\frac{5}{8}$  in. to  $1\frac{1}{4}$  in. inclusive, for three and four groove taps.



Write for circulars and price list.

Also makers of the ATLAS SWIVEL VISE and  
ATLAS TOOL MAKER'S VISE.

ATLAS MACHINE COMPANY, PROVIDENCE, R. I.



### THE LIMA

The BEST POWER for the Showowner.

PRICES \$90 TO \$1,200.

Warranted 100c. for One Dollar.

Sizes: 3 to 50 H. P.

Originators of Successful Cross Head Gas Engines.

Write for Particulars.

THE LIMA GAS ENGINE CO.,  
LIMA, OHIO.



## VULCAN IRON WORKS

MASON CITY, IOWA.

INCORPORATED

Prices and goods right.

Catalog free, write today.

### Universal Tenon

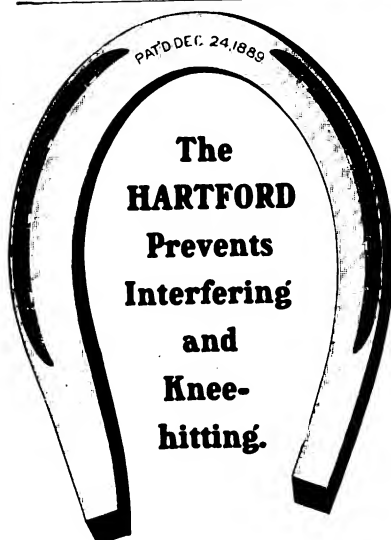
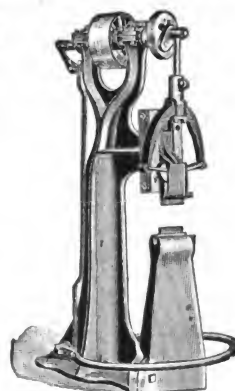
AND

### Boring Machine

for wagon repair shops.  
Cuts tenons on set of  
wheels in 12 minutes.

### Vulcan Power Hammer,

Only perfect adjustable  
stroke, operated en-  
tirely by treadle.



The  
**HARTFORD**  
Prevents  
Interfering  
and  
Knee-  
hitting.

## Do You Use the Best Side Weight

## And Toe Weight Shoes

Made in this Country?

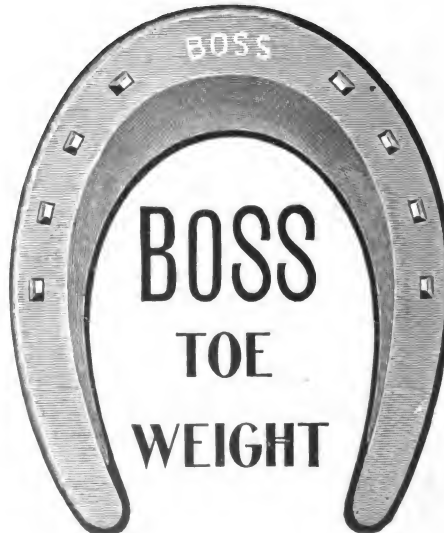
## BOSS AND HARTFORD SHOES

have the highest reputation among the trade. Cost same as inferior makes, mean less labor. Are far superior to a hand made shoe. Carried by all Leading Jobbers.

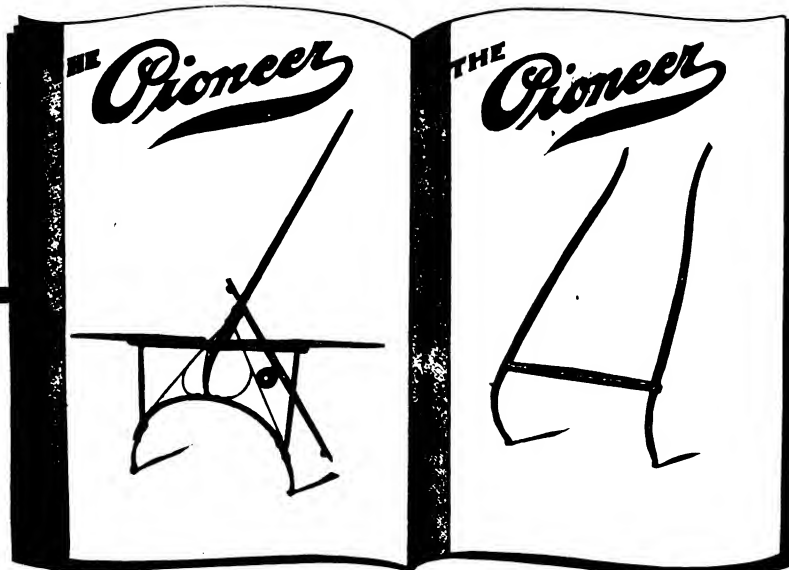
SEND FOR CIRCULARS.

Sample pair of either size or weight mailed post paid on receipt of 50 cents.

**THE SIDE-WEIGHT  
HORSE SHOE COMPANY,**  
Mechanic St., HARTFORD, CONN.



BOSS  
TOE  
WEIGHT

**IRONING FACTORIES**

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Cincinnati, O.  
Canton, O.  
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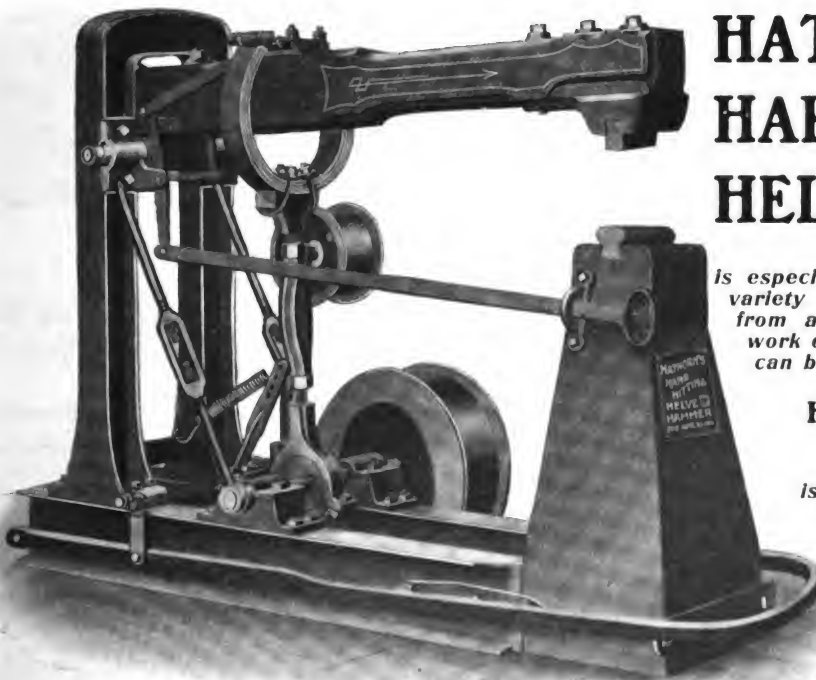
Piqua, O.  
Troy, O.  
Akron, O.  
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***SEND FOR THIS BOOK***

**W**E would like to have your permission to send you a copy of our Catalogue, showing the different styles and sizes of poles and shafts manufactured by us.

The PIONEER BRAND has been brought to a standard of excellence in quality and style by the result of years of labor and study of the trade's wants, and is recognized as the peer, as is attested to by the most critical manufacturer, and is demanded by all buyers of vehicles throughout the country. Address all communications to

**The PIONEER POLE & SHAFT CO., Piqua, Ohio.**



## HATHORN'S HARD-HITTING HELVE HAMMER

*is especially adapted for shops doing a great variety of work. No time is lost in changing from a light to a heavy stroke and much work otherwise requiring two or three heats can be done in one heat.*

### HATHORN'S HARD-HITTING HELVE HAMMER

*is the Simplest, Cheapest, Most Effective and Most Durable Hammer on the Market.*

*The foot lever, brake and tightener are all adjustable to suit the operator. The shafting used is large, all boxes are wide, and the best babbit is obtainable is used.*

**THIS HAMMER SHOULD BE IN EVERY SMITH SHOP.**

Send for interesting circular.

Ask your Dealer or write to  
**Hathorn Foundry and Machine Company,**  
GRINNELL, IOWA.

**THE Apple**

**STOP WASTING GASOLINE!**

A weak, uncertain current, such as the average battery gives, wastes enough gasoline to pay for an Apple Automatic Sparker. No Switches. No Belts. No Batteries for starting or running. It furnishes a strong, healthy spark all the time. Write us for more information.

**The DAYTON ELECTRICAL MFG CO.,**  
152 Beaver Bldg., DAYTON, Ohio.



**THE ITHACA THIRD SEAT**  
Price \$1.50

Will allow the Third Person, and the occupants of a Buggy or Cutter Seat, to ride with ease and comfort.

Try one and be convinced that we have the only Third Seat made that will sit steadily on a spring cushion. The only one wide enough for an adult to ride with comfort. (14 inches wide). To have the Seat well advertised, for the Spring Trade of 1906, for the next sixty days we will ship by express, to any dealer or blacksmith, one of our Seats, on receipt of 85 cts. (Eighty-Five Cents).

Manufactured by  
**THE ITHACA CARRIAGE CO.,**  
ITHACA, N. Y.

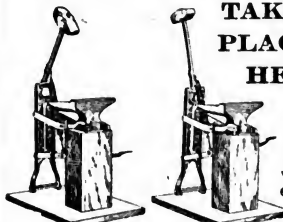


**The "Modern Foot-Power Hammer"**

**TAKES THE PLACE OF A HELPER**

by the anvil, for sharpening, plowshares, cultivator shovels, etc., and for nearly all kinds of general forging and welding also for striking on tools, such as Chisels, Punches, Flatteners, Swages, etc. Will strike just as light or heavy as desired by the operator and is very easily operated. Cannot be fully appreciated until tried. Write for circular, testimonials and price.

**AUG. S. LOCKREM,**  
PIERPONT, S. D.



**ONE HORSE POWER**

**WILL RUN IT.**

**The Perfect Power Hammer**

Never fails to prove its superiority and is always ready to stand the test of endurance.

This Hammer is best adapted to  
**Plow and General Job Work.**

Also has an  
**ATTACHMENT FOR SHARPENING DISCS.**

This is an Exclusive Feature.

**THE PERFECT POWER HAMMER**  
HAS A DIRECT VERTICAL STROKE  
NO SIDE MOTION.  
NO BREAKAGES.  
NO REPAIRS NECESSARY.  
THE WIDEST RANGE OF WORK, FROM  
THE LIGHTEST FORGING TO HEAVY  
AXLE WELDING.

**The Perfect Power Hammer**

is simple, powerful and easy to operate.

Requires but one horse power to run it.

**We Guarantee the Best Material and Workmanship, and will Replace any Defective part Free.**

**Macgowan & Finigan**  
**Foundry & Machine Co.**  
ST. LOUIS, MO.

**MADE IN 3 SIZES**

Write for Prices.



**THE STANDARD COUPLER.**

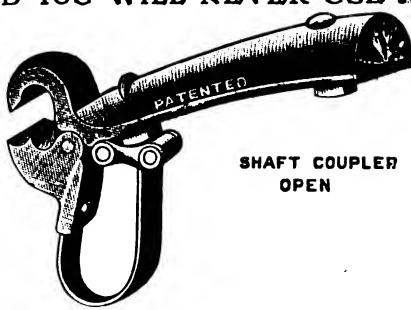
OVER 1,000,000 COUPLERS SOLD IN FOUR YEARS.

TRY IT AND YOU WILL NEVER USE ANY OTHER.

used with Regular Shaft Shackle. Fits Any Size Bolt Perfectly. No Loose Bushings.

**Operated Instantly. Perfectly Made. Every Coupler Warranted.**

**SOLE MFRS. METAL STAMPING COMPANY. NEW YORK.**





## BUFFALO No. 666

## Portable Down Draft Forge

A MOST INGENIOUS APPLICATION OF THE BUFFALO DOWN DRAFT SYSTEM.

ALL SMOKE, GASES, FUMES AND CINDERS ABSOLUTELY DONE AWAY WITH.

The hottest flames and stifling heat can no longer cause the smith such discomfort as he has hitherto been compelled to submit to.

## HOW THEY WORK

On turning the crank of the powerful No. 200 Blower attached to this forge, all smoke and gases from the fire are drawn into the stack by means of the draft produced by a connection to fan case. The larger part escapes up the stack by reason of the natural and induced draft while a portion passes through the fan into tuyere. A separate connection from blast pipe into stack strengthens the natural draft and is of great service when fire is being started.

Every Forge is Complete in Itself, and Needs no Exterior Contrivances Whatever.

## NO ADDITIONAL POWER

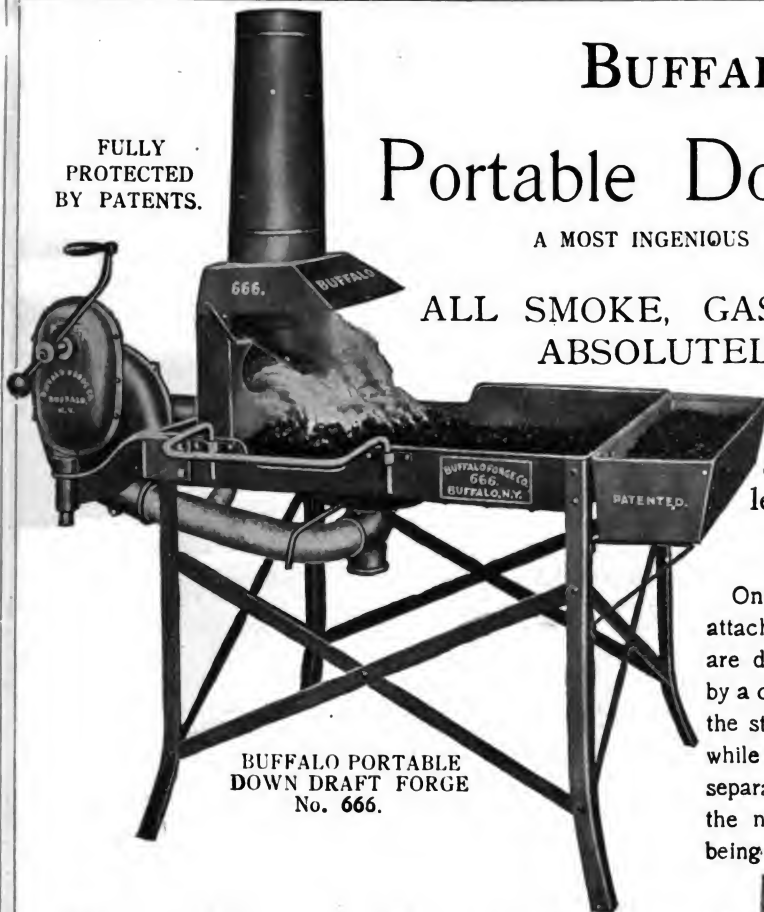
No additional power is necessary to operate blower. In place of taking air at the fan case, blower takes it from over the fire, producing a strong draft without extra effort.

Put in a Buffalo No. 666 and keep the Smithy Clean, Cool and Light.

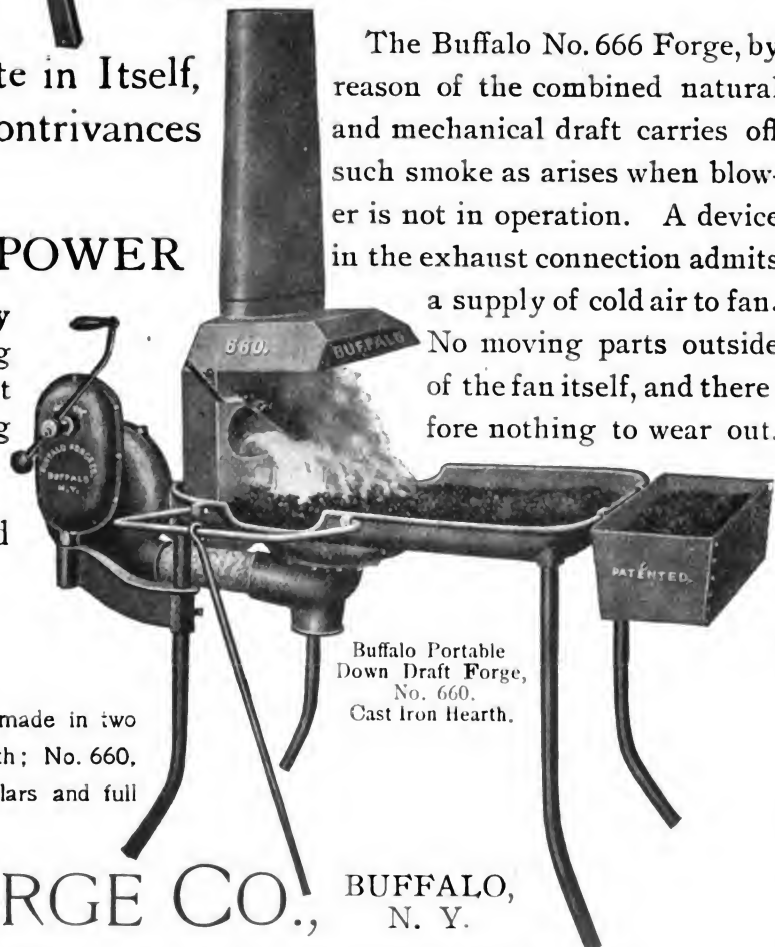
Buffalo Portable Down Draft Forges are made in two styles: No. 666 made with Steel Plate Hearth; No. 660, made with Cast Iron Hearth. Send for circulars and full particulars.

**BUFFALO FORGE CO.,** BUFFALO, N. Y.

THE CANADIAN BUFFALO FORGE CO., Ltd. MONTREAL.



BUFFALO PORTABLE  
DOWN DRAFT FORGE  
No. 666.



Buffalo Portable  
Down Draft Forge,  
No. 660,  
Cast Iron Hearth.

The Buffalo No. 666 Forge, by reason of the combined natural and mechanical draft carries off such smoke as arises when blower is not in operation. A device in the exhaust connection admits a supply of cold air to fan. No moving parts outside of the fan itself, and therefore nothing to wear out.

# A LARGER AMERICAN BLACKSMITH

## Do You Want a Bigger and a Better Paper?

THIS PAGE IS OF VITAL INTEREST TO ALL OUR SUBSCRIBERS.

The more subscribers we have the better we can make the paper. Hence we announce the following plan by which our readers can co-operate with us to make this paper of greater value to them: The way is, simple; the reward sure.

If by January 1st, 1907, the number of subscribers to The American Blacksmith totals 40,000, we will increase the reading pages 50 per cent. and publish 30 pages of solid, practical, reading matter, instead of the already liberal 20 pages we now guarantee readers each month. This number can be easily secured if each of our present readers send us at least one new subscriber during the year. Will you help? You can very readily do some craft friend a favor, help us, and get a special reward at the same time if you make the effort now.

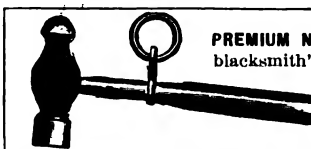
**To induce you to act promptly** and send in a new subscriber at once before you forget, we offer you your choice of any one of the following premiums for each new subscriber which you send us. Don't delay. Call on or write some brother smith, tell him how interesting and valuable you find the paper. Give him a copy of your paper to look over—we will replace it free of charge. Then send us his dollar for his year's subscription. But be sure to tell us which one of the premiums you want. Can we count on you to do this?



**PREMIUM No. A.** This consists of a complete rubber stamp outfit. The stamp can have two lines on it, your name and address, as

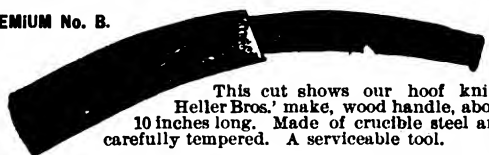
**JOHN A. CARTY,  
EDEN, N. Y.**

A pad in a neat box furnished for inking the stamp. It is a mighty useful little outfit. With it you can sign your name neatly and quickly on letters, bills, envelopes, etc.

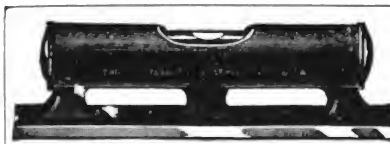


**PREMIUM No. D.** This is a miniature blacksmith's hammer watch charm. It is  $1\frac{1}{4}$  inches long and highly polished. A nice charm for a smith.

**PREMIUM No. B.**



This cut shows our hoof knife, Heller Bros.' make, wood handle, about 10 inches long. Made of crucible steel and carefully tempered. A serviceable tool.



**PREMIUM No. E.** Our bench level is  $3\frac{1}{4}$  inches long, neatly finished and very accurate. Handy to have around.

**PREMIUM No. C.** This watch charm is a neatly finished model of a monkey wrench. In spite of its small size,  $1\frac{3}{4}$  in. long, it works just like a big wrench the jaws opening  $\frac{1}{4}$  inch.



**PREMIUM No. F.**

**This is a six months free subscription to The American Blacksmith.**

## Our Prize Contest for 1906.

To make the paper more interesting and helpful during the coming year and to secure good, practical reading matter for the larger paper we expect next year, we have decided to offer the following prizes for the best articles of any length on any subject connected with the smithing craft. For the five best articles a prize of \$5 each, and to all other contestants whose articles are accepted and published, a year's subscription to The American Blacksmith.

The articles may be on shoeing, vehicle-work, painting, shop kinks, home-made tools, power, repairing, ornamental iron work, difficult forgings, or any of the many other practical shop topics. They can be submitted any time during 1906 up till December 10th. The announcement of the prize winners will appear in the January issue of 1907. All articles will be judged for their practical shop interest and value. A short item of only a few lines may contain information of such value as to gain a subscription or even a \$5 prize. It is the men in every-day harness who are learning new kinks, and we want to tell our readers about them.

Any person, whatsoever, can submit one article or as many articles as desired, thus increasing his chances of a prize or prizes. Each manuscript should be plainly written and on one side of the paper only. All articles must be headed "Prize contest."

Any person wishing to submit more than one article need not send all at the same time. A good suggestion is to write your articles as you come across the various new devices or think of ideas of value to you in your work. So keep your eyes wide open during the coming year and remember that each published article long or short wins a prize. We hope that every one of our readers will be heard from during the year.

# THE AMERICAN BLACKSMITH CO.

Box 974, BUFFALO, N. Y.



# ARE YOU A MEXICAN?

DO YOU STILL USE OLD-FASHIONED, GRANDFATHER WAYS?

This Page is intended for those not Regular Subscribers.

**O**F COURSE you don't do your work in the primitive, cumbersome way, like the Mexican in the picture, but just the same, there are lots of new tools, improved methods and practical kinks being discovered every day and told about every month in **THE AMERICAN BLACKSMITH**, that you will find of interest and value in your work.

## LOOK THROUGH THIS

number—each succeeding one will be as good or better. We guarantee each month 20 pages of solid, practical shop information by the foremost writers of the country. Twenty pages, free from trade puffs, stale clippings and the like. Besides this, in the advertising pages, you will find interesting announcements of the latest tools and shop appliances being brought out by foremost American manufacturers. Our Honest Dealings paragraph which appears in every issue, (advertising page 76) guarantees the entire reliability of all our advertisers. No gold brick advertisements allowed—we protect our readers.



A MEXICAN SMITH SHOP. THE MAN SITTING WORKS THE PRIMITIVE BELLOWES BY HAND AND FOOT POWER.

JUST A HINT of articles which have already appeared is sufficient to convince you that "THE AMERICAN BLACKSMITH" is really the largest dollar's worth that goes into the smithy."

Plans for the Making of a Wagonette.  
A Few Dont's for Wagon Repairers.  
Seasonable Styles,  
Pointing Listers and Plow Shares,  
A Queer Shop in Texas.  
How to make a Post Anger.  
Some Locomotive Forgings.  
A Talk on Coil Springs.  
The Making of Socket Wrenches.  
Machine Foundations.  
How We Made a Power Hammer.

Another Knee Knocker—A Special Case.  
The Practical Side of Horseshoeing.  
A Clamp for Rimming Wheels.  
A Tool for the Smith Without a Helper.  
How to Make a Spring Head.  
A Machine for Driving Spokes.  
How the Mule with Seedy Toe Was Cured.  
To Make a Tack Hammer.  
Hardening Track Chisels.  
A Horseshoe With a Cover.  
A Tire Furnace vs. Cold Setting.

Welding Tires.  
Work During Slack Time.  
How to Make a Cheap Wedge Block.  
To Forge a Gaff Hook.  
A Progressive California Smith.  
Electric Power in a General Shop.  
How to Straighten a Round Edge Tire.  
Curing a Horse That Cross-fires.  
How to Temper Butcher Knives.  
Varnish Crawling on Ivory Black.

This is a partial list of the articles which appeared in one single number, picked at random from recent issue—future numbers will be even better. Read below what our present subscribers say about THE AMERICAN BLACKSMITH. Many readers say each copy is worth the whole year's cost. Lots of them have subscribed for five years in advance. Smiths in far away Australia and New Zealand are eagerly subscribing.

## WE WANT YOU

to subscribe today—this very minute. As the paper is worth ten times its price, the principal reason why you will not subscribe will be because you will put it off. But we don't want you to say MANANA (tomorrow), like the Mexicans do. To induce you to subscribe today, we therefore offer you the choice of any premium on the opposite page if you will fill out the corner coupon NOW. To get a premium

## ACT AT ONCE.

You can remit by money order, stamps or registered letter. If your order is received before our supply runs out we will also send you in addition to the premium one of our handsome 1906 Calendars free, together with a supply of our famous Pink Buffalo Stamps that are being so much talked about by our readers. These stamps are supplied free with full instructions about their use and purpose.

## CAN YOU MAKE ONE DOLLAR GO FURTHER?

ORDER TODAY AND SAY WHAT PREMIUM YOU WANT.

The paper is a great help to me. I get the worth of my money out of one paper. It is a God-send to the craft.  
S. T. HAMMOND, West Point, Ga.

I would not be without the paper for five times the price; the articles on horse-shoeing are worth the price of the paper alone.  
R. F. DUNCAN, Plainview, Oregon.

I would not like to run my shop without it. It has saved us many times its cost each month, and then the advertising matter in the paper. puts one in touch with good business firms.  
C. S. HOLMES, Irene, Illinois.

I would not be without it for five times the price. I find some valuable information in every one I get.  
S. J. BLANCHARD, Henleyville, California.

No tradesman should be without The American Blacksmith. In fact it should be put into the hands of the apprentice as soon as he enters the shop, and through it he will be able to learn the trade quicker. I admire the way in which the paper is endeavoring to secure higher prices.  
M. QUINLAN, Proepunkah, Australia.

It's worth its weight in gold.  
F. L. MATTOCES, Eureka Springs, Arkansas.

The  
American  
Blacksmith  
Company,  
Buffalo, N. Y.

Gentlemen:—Enclosed please find one dollar to pay for one year of The American Blacksmith.

I desire Premium No. ....

Name .....

Address .....

CLIP THE COUPON NOW.

The American Blacksmith Co.,

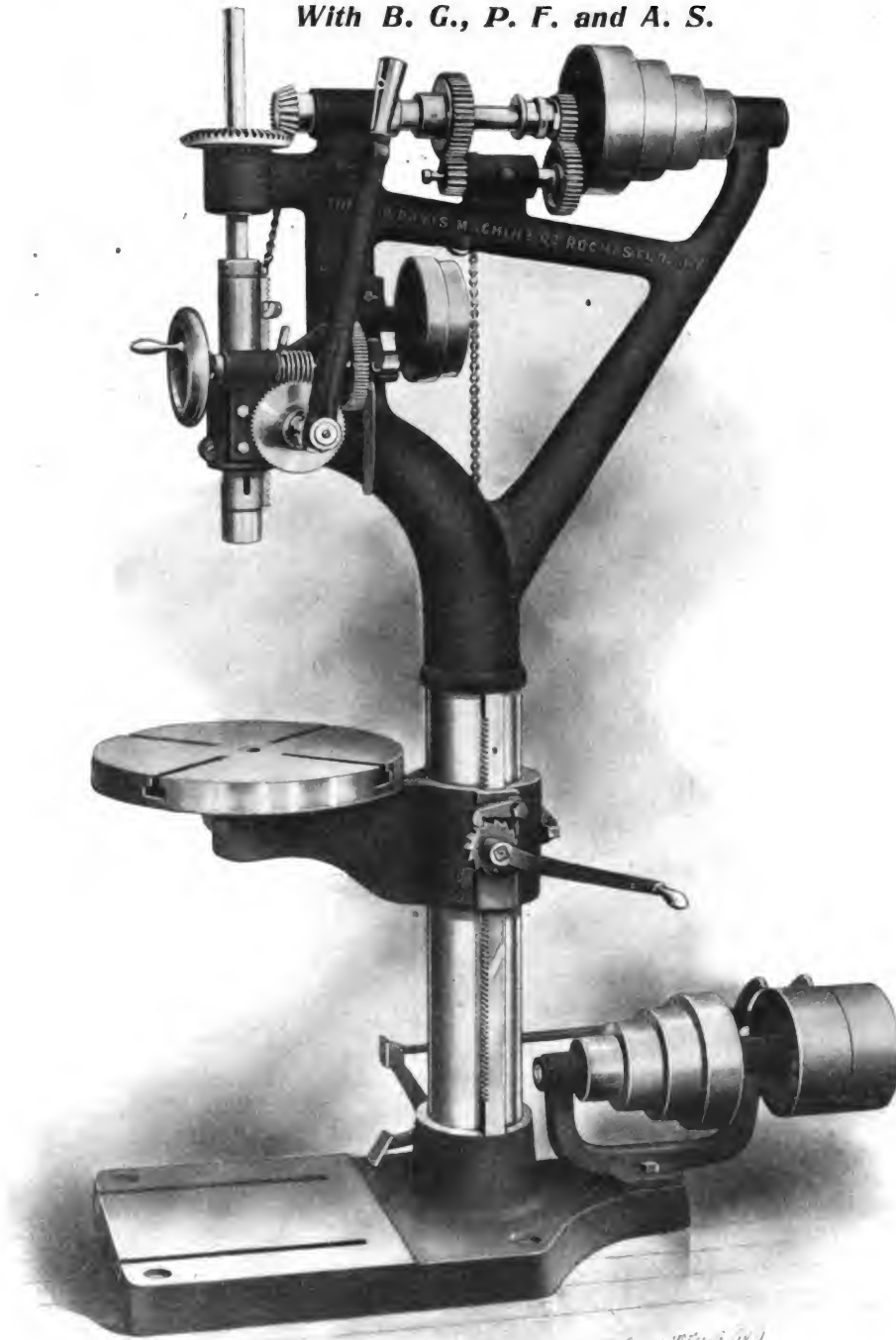
Box 974.

Buffalo, N. Y.



# ***Davis 20-inch Drill***

*With B. G., P. F. and A. S.*



*Arranged with short base and special arm for drilling tires on the wheels when desired.*

This drill is being used by the U. S. Government, railroad companies and large manufacturing plants which is a guarantee of its excellence; and can be ordered direct or through representative dealers in all large cities in the United States and Europe.

Price, \$75.00, net cash, f. o. b. Rochester, N. Y.

*Arranged for tapping and thread cutting \$10.00 additional.*

***The W. P. Davis Machine Co.,*** **ROCHESTER, N.Y.**  
**U. S. A.**





# BOSS

## LEATHER APRONS



Have you tried them?  
They outwear six of the  
ordinary kind.

Send us your name and address and receive a miniature  
APRON FREE.

Our Aprons are made of cow hide, purely bark tanned,  
soft, pliable, strong and durable. You will appreciate  
the superior quality and extreme comfort of

## THE

# BOSS LEATHER APRON

ASK YOUR JOBBER FOR THEM

If he cannot supply you, send your order direct  
to us. Upon receipt of price we will ship a  
perfect "Boss" Apron to you, charges prepaid,  
or will send same by Express, C. O. D. giving you  
the privilege of examining it at Express Office.

If it does not suit you send it back at our expense.



The "Boss" Aprons come complete either  
with or without bib. They have brass  
eyelets and leather straps and every  
possible convenience.

### PRICES.

#### "THE BOSS."

Size X, 30x36 in., \$1.50  
" A, 26x33 in., 1.25  
" B, 24x30 in., 1.10  
" B, 24x27 in., .85

#### "THE BOSS" with Bib.

Size D, 30x42 in., 1.75  
" E, 28x38 in., 1.50  
Size F, 26x34 in., 1.25

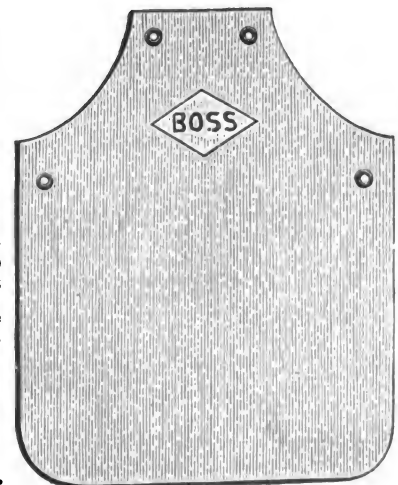
Write to us today and we will send you a miniature  
Apron showing the material used and how they are made.

## EDMUND C. BECKMAN,

SOLE MANUFACTURER,

712 N. Fourth St.,

ST. LOUIS, MO.



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SINGLETREES AND NECK-YOKES

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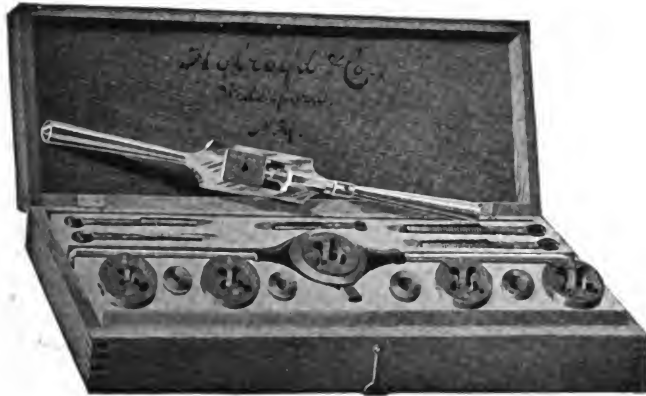
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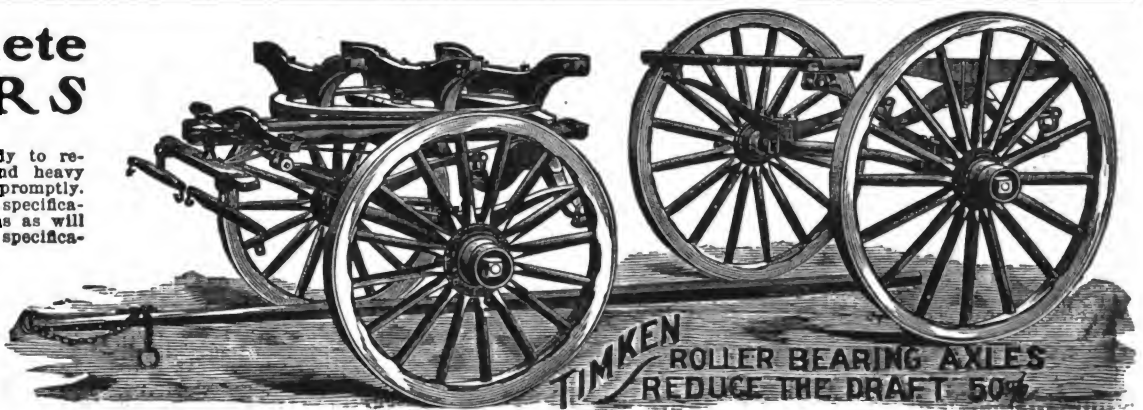
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is that a Tire will either add or detract from the intrinsic merit of a vehicle. Poor tires make a good vehicle bad, while good tires—tires that last—will add fame to the vehicle equipped with them.

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Tires have a record of demonstrated durability. They fit, they wear like iron, they hold to the rim, and they give utmost satisfaction.

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## "Sterling" Hack Saws Without A Peer

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They are made of the finest grade Tool Steel which makes them the most durable. Again, we guarantee them to cut straight and quick all kinds of metal. They are peerless, too, as sellers. One satisfied customer invariably brings another for "The Sterling."

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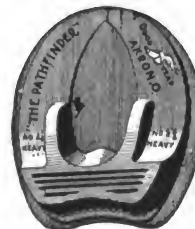
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Canvas Back. Closed or Open. Extra High Heel.

Our pads are the best, because they are correctly made; are made from the best rubber; easy to fit; all are guaranteed.

PATHFINDER HIGH.



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# THE AMERICAN BLACKSMITH

A Practical Journal of Blacksmithing and Wagonmaking

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## On to the Fifty Thousand Mark.

To those of our subscribers who take a lively, wholesome interest in the betterment of craft conditions, and almost every one of our readers, we think, comes under this head, we desire to make this New Year Appeal. The influence and helpfulness of a carefully edited and widely read smithy paper goes without saying. Now you, friend reader, can help us to make THE AMERICAN BLACKSMITH still better and extend its influence in the blacksmith world by getting one or more smiths to subscribe. The more readers we have supporting the paper the better periodical can we give you and the craft. And we do not ask it of you for this reward only. Until further notice, we offer to extend the subscription of any reader six months, in return for each new subscription he will get and send us. A sample copy of THE AMERICAN BLACKSMITH will be sent to any address in the world free upon request.

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From their inception a year ago THE AMERICAN BLACKSMITH's pink Buffalo stamps have been a success. The frequent calls for duplicate lots show that the little pink squares are decidedly popular. THE AMERICAN BLACKSMITH demands fair treatment and square dealings for its readers, not only from the firms advertising in our pages but from all manufactures and dealers of smithing goods with whom they may do business. One of these stamps attached to the face of each letter which you write to any firm from whom you expect to buy, will tell such a firm that you are a reader of THE AMERICAN BLACKSMITH and that you have that periodical back of you. If any firm to whom you have written letters bearing these stamps treats you dishonestly or unfairly, complain promptly to us. Any may be such that we will back you up in any just complaint to the full extent of our influence and ability. We will investigate the matter and use our best endeavors to help you to get satisfaction. In the "Honest Dealings" paragraph appearing each month we guarantee readers against loss from any firms who chance to gain admittance to our advertising columns and who prove to be deliberate swindlers. We would thank our readers for prompt information in such cases. We cannot, of course, undertake to settle petty disputes with honorable firms, when differences arise, as from goods missent, damaged in shipment and the like. It is a significant fact that we have never been called on to make good any loss under our "Honest Dealings" guarantee. Look it up in this copy and read it.

Fresh supplies of these stamps will be furnished free of charge upon application at any time. Hence you can use them without stint. None but readers of THE AMERICAN BLACKSMITH will be supplied with these stamps and new

subscribers will be sent a liberal number immediately upon receipt of their order for the paper.

Of course we cannot guarantee the reliability of any but the firms advertising in THE AMERICAN BLACKSMITH. But we will do all in our power to secure honest treatment for you in any case. Hence use the stamps freely to let those with whom you deal know that you are progressive, enterprising and up-to-date and therefore a customer worth holding long and treating well.

## To our Craft Readers New and Old.

A word regarding THE AMERICAN BLACKSMITH and its policy will not be inappropriate at this time, owing to the fact that this issue will be read by many craftsmen who have never before had an opportunity of examining the paper. To these smiths we would especially say that this month's paper is a special number only in point of its double circulation. Every issue to follow will contain just as many pages of solid—practical—interesting reading, with no trade puffs, stale clippings and the like. The regular contributors to the columns of THE AMERICAN BLACKSMITH are among the foremost craft authorities. Take this issue for instance; we find Mr. E. W. Markham, author of the "American Steel Worker" and foremost authority on the subject of steel; Mr. John L. Bacon, writer of "Forge Practice" and head of Mechanical Engineering department at Lewis Institute; Mr. M. C. Hillick, author of "Practical Carriage and Wagon Painting," whose writings are accepted as authoritative by all in the trade; Mr. Nels Peterson, a vehicle builder of long practical experience whose suggestions have helped many of the American Blacksmith family; Mr. C. A. Richardson makes a specialty of difficult forgings and few indeed are the jobs he is unable to tell you how to accomplish; Mr. E. W. Perrin, that well-known horse shoeing specialist whose practical talks are greatly prized by our large number of farrier readers. Space does not permit us to enumerate all of

the contributions to this issue, but the foregoing will give you some idea of the high standard attained by THE AMERICAN BLACKSMITH. These and many other practical experienced smiths will fill our columns during the year 1906 with more valuable information than we have ever been fortunate enough to present heretofore.

Besides the practical and interesting

done in the shops is made as thoroughly practical as possible. The forge shop makes tools of all descriptions and odds and ends of all kinds for the other shops, and is equipped with down draft system. The hoods used were designed and made at the Institute. There are 16 ordinary forges and anvils, one forge for heavy work, a small brazing forge for charcoal, and a Stewart gas forge for case hard-

is then hammered out into a square bar  $\frac{1}{4}$  or  $\frac{3}{8}$  of an inch square. A ring or eye is then bent up out of the bar, the exact length of stock being first calculated and cut. After this a lot of old scrap is roughly welded together into a chunk about 6 inches long and  $1\frac{1}{2}$  or 2 inches square. This lump is heated to a welding heat, put under the steam hammer, and drawn down to about  $\frac{1}{2}$  inch square. After this no regular order is followed as it makes little difference what branch is touched on first.

All explanations given the class are given as much as possible in a general way. In welding, for instance, a general explanation is given for the various welds and shapes of scarfs, and several welds are made by the instructor before the class, but care is taken not to exactly duplicate the work to be done by any of the class. Perhaps the welds may only differ from those made by the student in the size of stock used but there is always some difference. This is the general idea followed throughout—to give the necessary instruction in such a way that each student must plan the work he has in hand for himself and must work out the application of general ideas to his particular "job". In connection with the work, a text book is used giving general explanation for making numerous forgings and describing various processes used in forge practice. With the aid of the text a student "digs" out his information for himself and thus gets much more out



A CORNER OF THE FORGE SHOP AT THE LEWIS INSTITUTE.

articles by our regular contributors the paper also contains a question department, where subscribers are invited to ask questions on such matters as puzzle them. We also invite readers to ask for special articles on any topic of craft interest. And numerous subjects have already been written about in response to such requests. Truly THE AMERICAN BLACKSMITH is "the largest dollar's worth that goes into the smithy". If you are not a subscriber, we should like you to get acquainted. Ask for our little pamphlet telling what subscribers think of THE AMERICAN BLACKSMITH. We will gladly send it without charge. It contains unsolicited testimony from every state in the Union.

### The Forge Shop at Lewis Institute.

JOHN L. BACON.  
Instructor in Forge Practice.

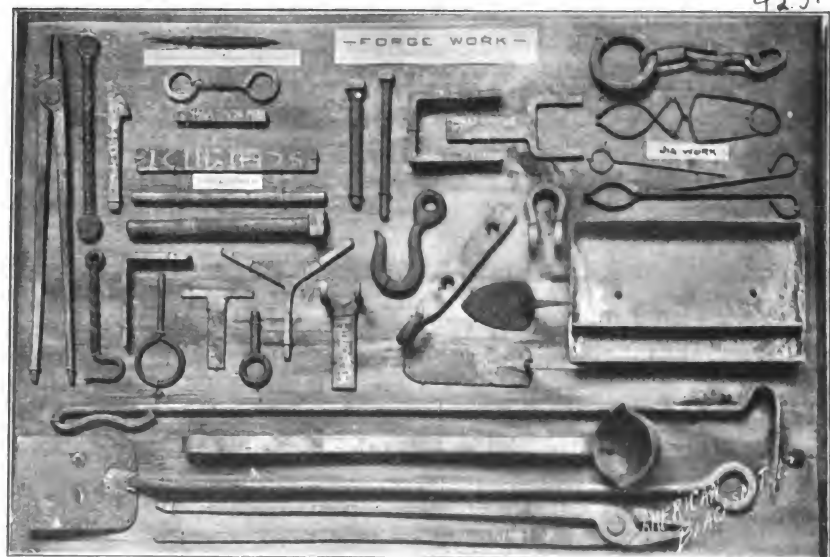
Lewis Institute, Chicago, started in the fall of 1896 and offered a six year course in engineering, science, and the regular classical work, through the four years of high school and the first two years of college. The greater demand for the engineering work soon led to the offering of a full course in Mechanical and Electrical Engineering, covering the entire college course and giving on completion the degree of Mechanical Engineer. The Institute has now enrolled about 2500 students including all classes, day and evening.

The shops of Lewis Institute in addition to numerous laboratories and drawing rooms, comprise an elementary wood shop, forge shop, foundry, pattern shop, and two machine shops. The work

ening and tempering. For heavy work a Bement-Miles steam hammer is used. There is also a drill press and a double emery grinder in the shop.

The foundry makes all the castings used varying from light brass or iron castings of only a few ounces to lathe beds weighing 400 or 500 pounds.

The elementary course in forge work covers three months. The following list of required work is for the present "quarter" (three months). After about the first week's work every exercise or



EXAMPLES OF WORK DONE BY STUDENTS AT THE LEWIS INSTITUTE.

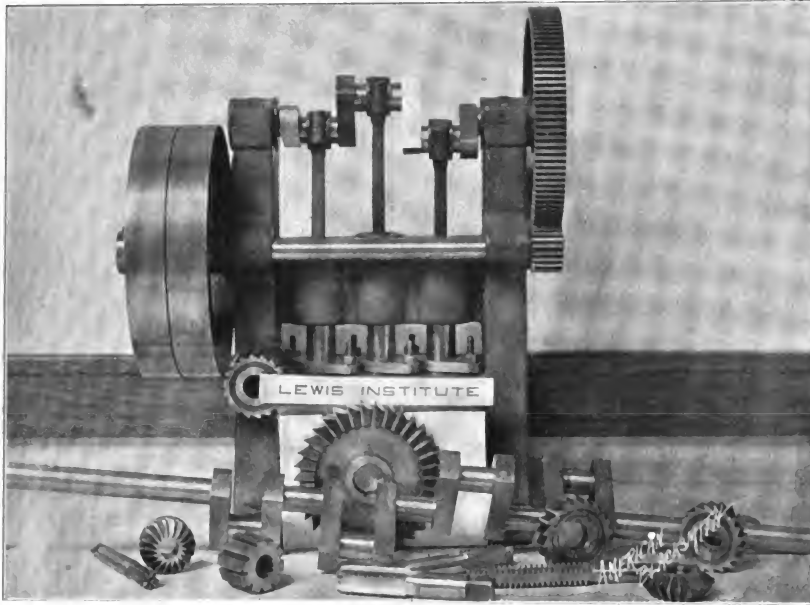
piece of work given the student is treated as a problem to be worked out by himself. The first work done is generally a little preliminary practice in figuring stocks for rings, eyes, links and bent shapes. A piece of old scrap

of his work. As an instance, a boy is given a piece of tool steel about a foot long and half inch square and told to experiment with it until he finds the proper hardening heat. This is all the explanation given and the chances are



he does not even know what "hardening" means, but after about half an hour's study and as much more time spent experimenting he is fairly familiar with the effect of heat on steel—par-

There is, in addition, to the above elementary course, one advanced course given to older college students in mechanical engineering who have previously taken the elementary course.



MACHINE FORGINGS MADE BY STUDENTS AT LEWIS INSTITUTE.

ticularly a high heat. There are of course many details of manipulation, easy ways of doing things, and proper handling of tools, etc. that must be explained and illustrated, but this is generally done by individual instruction as the occasion requires. The forge shop makes, rough-grinds, and tempers all lathe and special tools used in the machine shops; forges blanks for, and tempers such tools as taps, reamers,

This consists to a large extent of shop management and economy. Jig work, designing of special tools, cost of work, shop equipment, etc., take up most of the time. The forging done is mostly machine forging and tool steel work.

The evening classes, are made up largely of men who have had more or less shop experience. The work while of about the same sort, is given in an entirely different manner. The method used is generally to make some forging before the class, the forging then being duplicated by the students. Summer classes are also sometimes held, the work being largely of a special character suited to the individual needs of the student.

These classes continue for six weeks.

#### The Story of a Strong Hand.

The accompanying engraving shows two views of one of the oldest smithies in England. In viewing them a question will no doubt come up in the readers mind concerning the arm and hand shown hanging in the window. The story is as follows: More than one hundred years ago, the smith then occupying the shop, happened to be very

busy and in need of a helper. Accordingly, he wrote to a brother smith at a sea-side village in the neighboring county, asking him to send a helper if he knew of one then not at work. A week or two later the occupant of the old forge received a reply directing him to go on the following Saturday to the four cross roads "Where the coach would drop a strong hand." Accordingly the smith met the coach, but only to find that his brother craftsmen had played a practical joke on him and had forwarded part of a ships figure-head in a box. "The strong hand" has hung in the old smithy at Earl's Colne, Essex, from that time to the present.

#### Carriage, Leather and Rubber Goods.—1.

Methods of Treatment to Insure Preservation.

M. C. HILLOCK.

The carriage painter in the jobbing shop is specially interested in the carriage top because to a greater or less extent he has much to do with this class of equipment—in cleaning it, dressing it with some mixture intended to prolong its days, and keeping a vigilant eye upon it while in service.

Of all tops, the leather top of first class quality is the easiest to care for and to maintain in proper condition. The liveryman, who is probably one of the



A STRONG HAND IN AN ENGLISH SMITHY.

milling cutters and the like. The shop also makes all the machine forgings used and shown in the engraving.



ONE OF THE OLDEST SMITHIES IN ENGLAND.

best judges of such matters, seldom, if ever, puts anything more than good castile soap and water on leather tops, his contention being that if kept well cleaned of acid and other possibly destructive accumulations such tops will wear better than if dressed over with the ordinary materials made for the purpose. At any rate, the writer during his experience as a custom-shop painter has interviewed many wide-a-woke liverymen on

this point and the opinion has been practically unanimous that an occasional washing with castile or other good soap and water is the best treatment. However, there comes a time in the history of every top when a simple washing will not suffice—when the condition due to wear and tear demands some sort of a restorative, something to build up lost vitality. Even in such cases it is sometimes questionable if some sort of an oily mixture containing a certain portion of coloring matter is not preferable to a regular top-dressing. A dressing or mixture to be made by the painter, for leather tops in the condition above described, should consist of, say,  $\frac{1}{2}$  gallon

machine buffed leather, when the top is badly worn may be made of 2 ounces of beeswax and  $\frac{1}{2}$  gallon of elastic body finishing varnish. Use the same proportions for making smaller quantities. Give this the proper depth of color by adding ivory coach black. Then thin to a brushing consistency with turpentine. For a hand buffed leather top, we would choose the first named mixture.

It will readily be understood, of course that for a long life of service much depends upon the care and attention and treatment given the top by the vehicle owner and user. The painter has a responsibility in this matter which he should not evade, and by the perform-

should be made to know that clean storage quarters are highly necessary to the preservation of the leather or rubber. Information along this line costs the painter nothing, and, like bread cast upon the waters, may return in the form of increased business.

Some leather tops come to the shop considerably cracked, and in this condition an unusually soft and elastic finish is desirable. Such leather requires a special treatment which may consist of sponging off with castile soap and water, and then after drying out, apply with a brush the following:—Boiled linseed oil colored with coach black. Permit this mixture to remain upon the

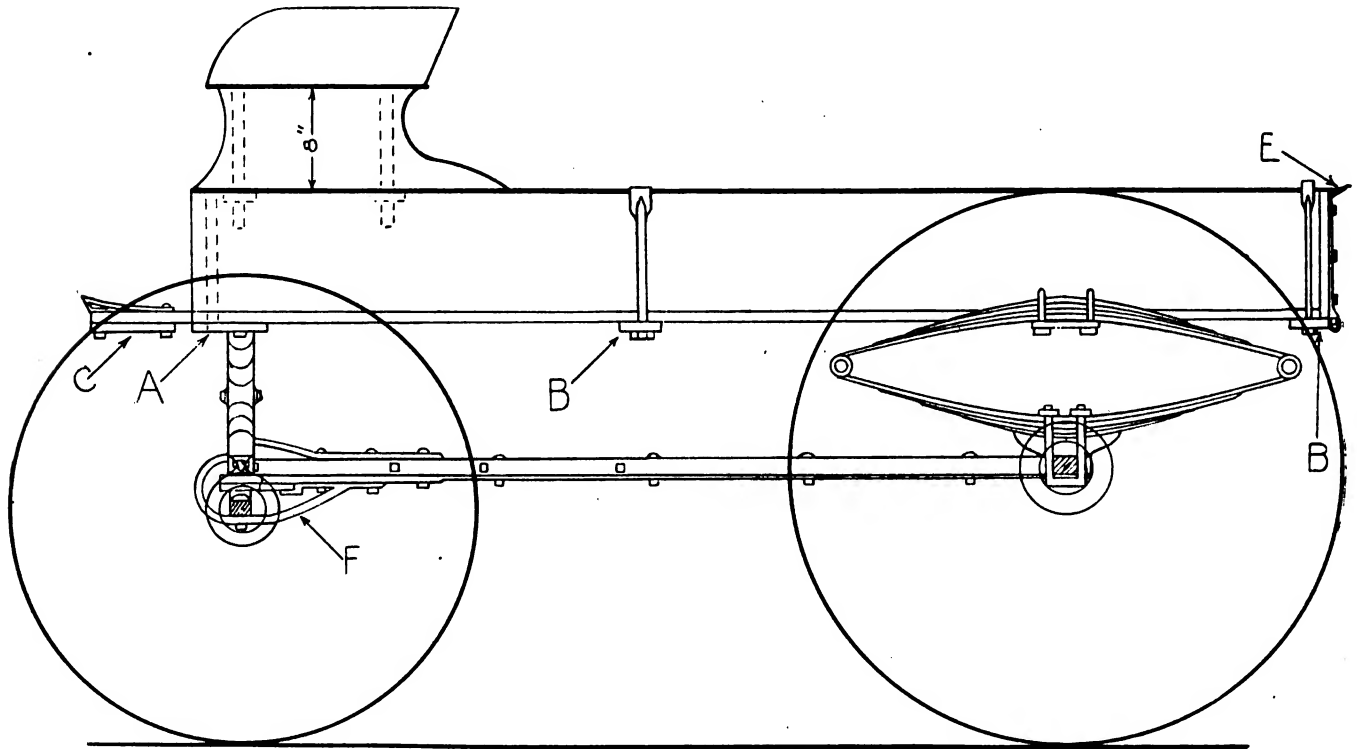


FIG. 1—SHOWING SIDE ELEVATION OF LIGHT DELIVERY WAGON

of neatsfoot oil and 2 ounces of beef suet, melted and fused together. To this quantity add a tablespoonful of melted beeswax, beating the ingredients intimately into combination. The beeswax serves to cool out the leather and gives it strength, while the neatsfoot oil and beef suet impart softness and that elasticity to be desired in a carriage top. In case the enamel of the leather is badly worn and the general finish shows a bad state of wear it is desirable to darken this mixture with drop of ivory black. First clean the top, using in all cases, if possible, castile soap and luke-warm water, and wipe dry. Then apply the mixture with soft rags.

Another formula used upon both rubber and leather, and especially

ance of which he may win a certain prestige for his shop and capture new trade. The vehicle owner and user should know through the medium of the painter that the leather top or any top, is injured by being let down, and then, with joints broken, crushed together. This is a wholly unnatural position for the top and enforces a strain upon it quite out of proportion to its strength. This is the main thing to be kept in mind in looking to the preservation of the top by the owner and user. Keep the top fully extended in its natural position. It is not too much to say that half the wear and tear of the top comes from the abuse of crushing the top together and leaving it in that position. Then, again, the top owner

leather for about half an hour. Then with clean, soft rags proceed to rub the mixture off. Continue wiping until a clean cloth shows no stain.

(To be continued.)

### The Construction of a Light Delivery Wagon.

NELS PETERSON.

The accompanying engraving is a working draft for a light delivery wagon. The simplicity of construction will appeal to any smith as being a feature worth studying. There is not a piece in the entire job that could not be made in any shop equipped for wagon work. Excepting of course, springs and axles which are usually purchased.

Let us consider the construction of the body. We first cut the front

bottom cross piece, A Fig. 1,  $2\frac{1}{2}$  by  $1\frac{1}{2}$  inches with a mortise in each end, into which the front corner posts are fitted. Then cut the center and end bottom

hold it in position until ironed off. The bottom boards extend forward of the front end board about nine inches to form a foot rest. This rest is reinforced

the rear bottom crosspiece by means of hangers (made of  $\frac{3}{4}$  by  $\frac{1}{2}$ -inch iron) and an eye bolt passing through the crosspiece as shown at D Figs. 2 and 4. These with a  $\frac{3}{8}$ -inch round rod, complete the hanger. A spring hasp, E Fig. 1, locks the end gate and holds it in place and the edges of the body being ironed all around, prevents excessive wear. Corner irons are fitted over the front corners thus holding them securely. The side panels are further secured to the bottom by means of ordinary box straps riveted to the inside of the panels and passing through the bottom crosspieces. A toe rail for the foot rest completes the ironing of the body.

The gear is also a comparatively simple affair. A reach  $1\frac{1}{2}$ -inches square and five feet nine inches long; a head block; one front axle cap; two spring blocks and two spring bars, make up the wood stock for the gear. About the only difficult part of the gear is the making of the fifth wheel. To the reach-lining, running the full length under the reach, is welded a heavy piece forming a T or head-block plate. This is made wide enough to admit of drilling holes at either side of the head-block, the holes being countersunk for tire bolts which are passed up over the lower half of the front spring taking a lip yoke as shown at A Fig. 3. For the lower half of the fifth wheel a D plate is made

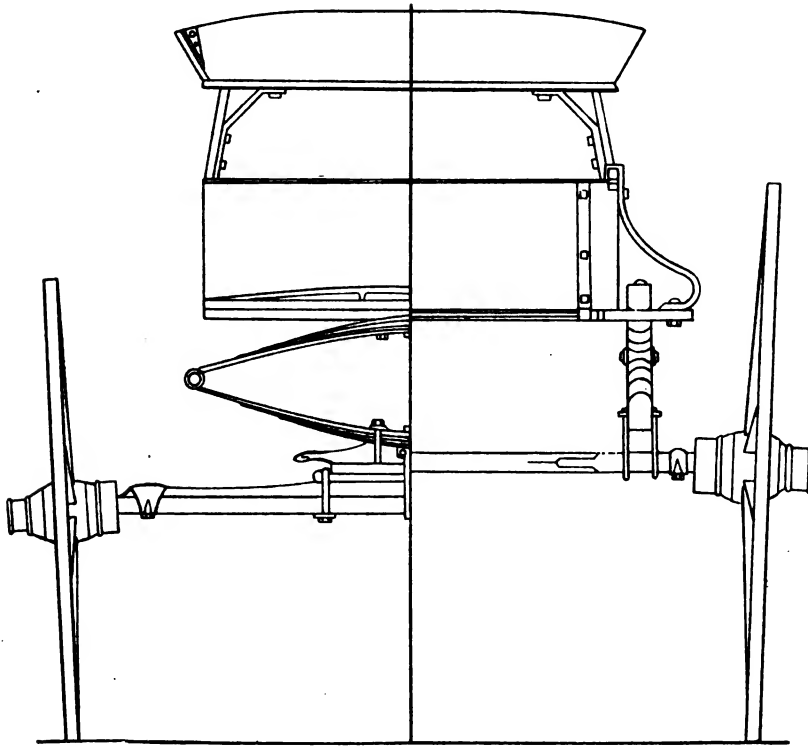


FIG. 3—SHOWING HALF FRONT ELEVATION. FIG. 2—SHOWING HALF SIDE ELEVATION.

cross pieces marked B. These project from the side of the body for about six inches, to support a brace for stiffening

by a crosspiece fastened underneath and dressed to the desired shape, as shown at C Figs. 1 and 4. The front

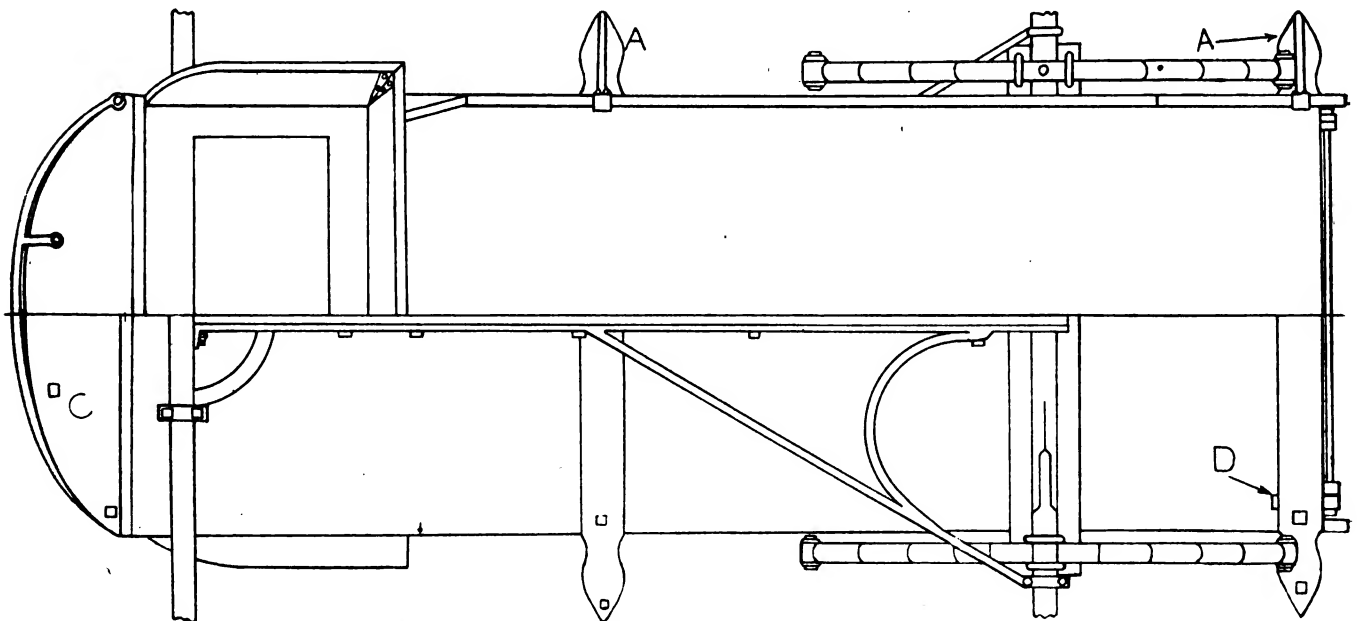


FIG. 4—SHOWING PLAN VIEW OF HALF TOP AND HALF BOTTOM OF DELIVERY WAGON.

the side of the body. See A Fig. 2, rear elevation; also A Fig. 4, in the plan. The bottom is next put in. This is of matched  $\frac{3}{4}$ -inch lumber of a width to suit your convenience, and only sufficiently nailed to the crosspieces to

end or panel board is then screwed to the front corner posts. In like manner the side panels are fastened to the front corner posts and then nailed to the bottom boards. The end-gate is a straight piece of hardwood fastened to

and secured to the front axle with a pair of clips B. Two woodscrews are also inserted on either side of the king-bolt hole. The king-bolt has a T shaped head and passes through the head-block and the axle, taking the

king-bolt brace underneath. This king-bolt brace is shown to better advantage in the side elevation at F Fig. 1. The balance of the irons for the gear are plain enough in the plan view of the draft and any further explanation would be superfluous.

### Making a New Plow Point and Pointing an Old Lay.

J. M. DREW.

Instructor in Forging, University of Minnesota.

There has been some discussion lately in the columns of THE AMERICAN BLACKSMITH on the subject of making plow lays and thinking that some pictures of actual work in this line would be interesting I have had photographs of my helper taken while he was in the act, of making a new lay or share and then putting a point on an old lay.

In Fig. 2, the piece of iron leaning against the plow is marked to show how



FIG. 2—FIT YOUR STOCK TO THE PLOW AND MARK THE BOLT HOLE.

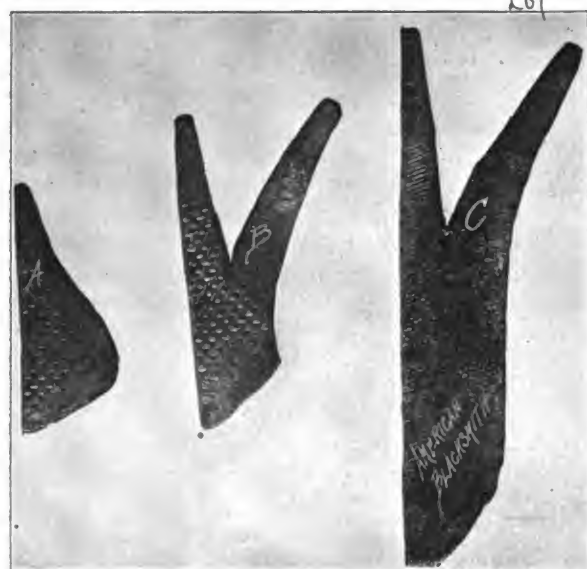


FIG. 1—TO POINT AN OLD LAY USE PIECES OF AN OLD RASP.

to make a short landside for a slip lay. The proper size of stock for this purpose is  $\frac{3}{4}$  by 3 inches. By cutting off 9 inches in length and marking across from opposite corners as shown in cut you will have material for two short landsides. After bending the long edge of the short landside to fit the curve of the lay, fit it to the plow so that the bottom edge will extend below the main landside about  $\frac{3}{8}$  of an inch to allow for the welding which will narrow it up somewhat. Next drill the bolt hole and fit the short landside to the plow. Fig. 2 shows the smith marking the iron for the bolt hole. You are now ready to fit the blank lay to the short landside. Put the blank in place as shown in Fig. 3 and let it extend beyond the edge of the landside  $\frac{1}{4}$  of an inch. Next put on the clamp as shown in Fig. 4, wedge it fast and take a light weld on the point to hold it fast. Then

move the clamp down to the middle, fasten it with a thick wedge and take a weld on the upper corner. This plan will enable you to avoid the creeping up out of shape, which is sure to take place if the welding is followed up from the point. Now weld the whole, solid and bend the point down under, take a good weld on it and trim it to shape. Fig. 5 shows the point doubled over and turned in the proper shape for welding.

To point an old lay when the point is simply worn too short, shape a piece like A in Fig. 1

and weld it to the bottom of the old point. In case the throat of the lay is worn away, shape a piece like B and weld it on the bottom; welding the wing piece to the bottom of the throat as shown in Fig. 6. In case the old point is very short, a piece like C. Fig. 1 (shown also in Fig. 7) may be made long enough to bend over as in Fig. 8 and welded down. The end which is bent over and welded to the top side of the lay is first thinned out to a feather edge.

In the case of a shop without power, a most excellent tool for shaping up points after welding, is an old horse-rasp fitted with a rather long iron handle. This is to be used while the steel is hot, and is to be followed with the file after the metal cools.

In these engravings, I have endeavored to follow as closely as possible, the several steps pursued by the plow repairer



FIG. 3—NOW PUT THE BLANK IN PLACE AND LET IT EXTEND BEYOND THE LANDSIDE.





FIG 7—WEDGE IT FAST AND WELD LIGHTLY AT POINT.

when repointing a plow and to have the illustrations plain and distinct, thus dispensing with the usual elaborate and generally unsatisfactory explanation.

#### A Practical Talk on Power.

JOHN B. CAMPBELL.

When I was a boy, tugging away at the bellows-pole or the drill-press, I would wonder why there was not some easier way of doing all this. And today when I was at the emery wheel, I thought what a relief it is from the old dull file, what a pleasure to watch the power drill cutting through those new tires, and how much easier the power hammer than the old fourteen pound sledge and the band saw over the old-time hand saw.



FIG. 7—IF TOO SHORT, USE A LONG PIECE.

I believe that the average smith working without power hesitates about installing it because of the first cost. They are afraid they will not have enough work to justify the expense. And it takes some courage to branch out in a new direction. But remember "Nothing ventured nothing gained". The first man in the neighborhood, to put in the power will attract attention. People come to his shop to see his engine run, and the machines he has hitched to it, and they will patronise his shop because with his improved facilities, he can do more work and save them time.

But the first problem that confronts the smith of moderate means, after having installed his engine, is, what kind of a machine do I need most? This depends on the locality and the nature of the work. As the requirements are different in various localities. In the



FIG. 5—BEND POINT OVER AND WELD.

first place don't make the mistake of getting too small an engine, for it is far easier to get three horse-power out of a five horse engine than out of a three horse engine. And you don't know what you may possibly want to hitch it to at some future time. It will also be less expensive in the long run. Having installed the engine and, of course, hitched the blower and drill press to it, why not rig up an emery stand? My experience is that files cost more than emery wheels. Besides, the emery wheel will do much faster work, and can be arranged at a small first-cost. From this point on, the smiths' inventive mind will be a great help to him. At small expense he can build his own machines, from ideas he will get in his trade journals, such as saw stands, band saw, power hammer etc. If I were in a locality where there was lots of plow work or mill work, such as would require

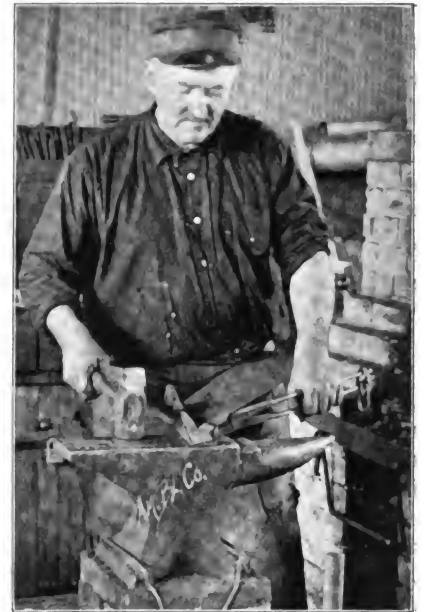


FIG. 6.—WELD THE WING PIECE TO THE BOTTOM OF THROAT.

heavy forging, I would no sooner be without a power hammer than I would without an anvil. The progressive smith will find that the better facilities he has for turning out work, the more work he will get to do, and the more work he has the more machinery he will need.

Those who can afford to put in power will find that they can do more work, do it easier, more expeditiously and with greater profit than they ever did the old way. Then you can go home after a good days work, with a light step, a clear mind, at peace with the community and yourself, and arise the next



FIG 8—THEN BEND IT OVER AND WELD.

morning fresh and ready for a good days work with no more stiff joints, sore muscles and blue atmosphere.

### Working Angle and Channel Iron—3.

JOHN L. BACON.

Angle iron can be easily and satisfactorily welded, but channels and particularly "I" beams, are not so easy to handle. The angles to be welded should be scarfed somewhat as the ordinary lap weld is shaped. The end of one piece should be tapered on the inside, the end of the other, on the outside, in the general shape shown in Fig. 16. The scarfs should be comparatively short and carefully fitted if a smooth appearing joint is wanted. A convenient way of handling when welding is to place the pieces as shown in Fig. 17. The first piece is laid on the anvil and held against a swage or other tool dropped in the hardy hole of the anvil, as shown. To weld on the other piece it is convenient to have some sort of specially shaped tool to reach the inside corner, as this spot is hard to get at with the ordinary tools. Such a tool may be made of an old cold chisel which has been ground down too far to be of farther use. The end of this tool is ground down until the sides make an angle of about  $85^{\circ}$  with each other as shown in the engraving. To make the weld the first

The outside of the work can be finished off smooth over the corner of the anvil. Channels may be welded in this same general way, one end of one piece being scarfed to fit inside of the end of the other piece.

Several heats will probably be required to properly complete the weld. Bars having an "I" shape are particularly difficult to weld and require considerable time and trouble. One method of making this sort of weld is to use two pieces of iron which will fill the grooves in the channel, and weld one in on either side, the ends of the "I" beam being simply butted together. This method is shown in Fig

18. After welding in the two blocks the lump thus formed is worked into the same section as the rest of the bar with the fuller and set hammer. This takes time and while it makes a sound joint, it is not advisable to use it except in cases of emergency. It generally being easier to make a new piece.

When using forms of any kind, particularly when bending light sections, it is very convenient to have a cast iron plate, or better yet a table top, made with "T" slots such as found in planer beds. The various forms used may be bolted to this with bolts whose heads are an easy fit in the slots. The slots should be of such a size that they will allow the bolts to be slipped in easily when the heads are held true with the slot, but will not allow the head to turn after being once inserted. When a table top or block of this kind is used the bending blocks may be made with a much lighter base. Considerable bending may be done with a plate of this sort without using any form at all, the bending being done around

bending may be done with bolts and discs as shown and the top may also be used as a surface plate. When the work is to be held securely, two bolts may be fastened to the table, the work



FIG. 18

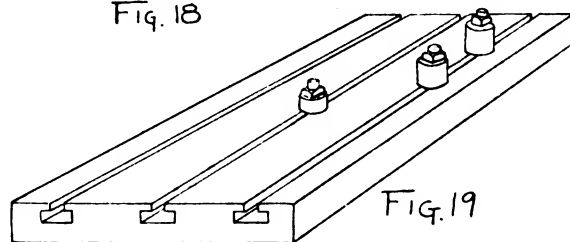


FIG. 19

FIGS. 18 AND 19—SHOWING METHOD OF WELDING "I" BEAMS AND A BED FOR BENDING.

placed between them, and a wedge driven in to hold it fast. Short bends may be made by placing a bolt in such a position that a lever may be pushed between it and the work and the lever used to force the bar the required bend.

Ship beams are sometimes bent up on a floor made of heavy cast iron plates perforated with square holes, somewhat as shown in Fig. 20. The desired curve is laid off on this floor from a wooden pattern. Iron stakes are dropped in the square holes, following the curve as nearly as possible, the curve being "padded out" with iron blocks where necessary. When the heated beam is laid on the floor other stakes are dropped in the holes on the other side of the beam and wedges, sledges, and levers are used to force the beam to the desired shape. These bending floors are generally laid off directly in front of the furnace where the beams are heated, and on a level with the charging door, in order to make the

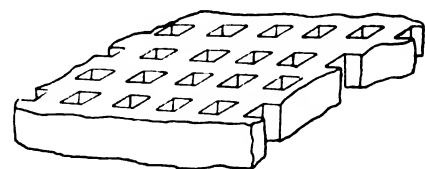
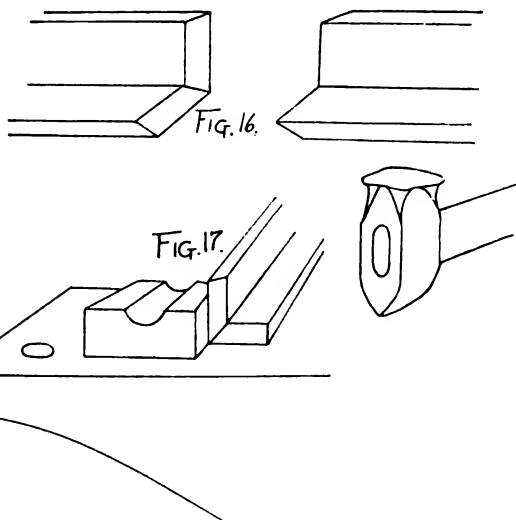


FIG. 20—BED FOR BENDING SHIP BEAMS.

handling of the heated work as rapid and easy as possible. It is customary to bend the entire beam in one heat when possible. This necessitates a very long furnace, and in order to use it to its full capacity, there is generally a bending floor at each end, the furnace being made to open at both ends. A small floor, or even a block several feet square

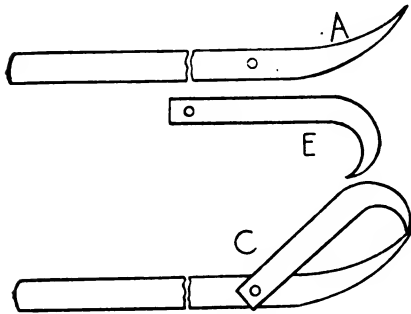


FIGS. 16 AND 17—SHOWING SCARFED ENDS AND METHOD OF SCARFING.

piece is laid on the anvil as shown and the other piece is laid on top in the proper position, the welding is then done with the special tool described above. The corner should be welded first, the sides being then worked down. Several heats may be required to complete the weld, particularly if the angle is wide and light.

the bolts fastened to the table slots. The bolts may be passed through discs, or even a string of washers may be used, fastening them down in the manner shown in Fig. 19. A heavy table top of this sort about two feet wide and four feet long is very useful in the forge shop, as a variety of

made in this general way is very convenient where much bending of a miscellaneous character is done. Bending machines are made and used for bending various sections, these machines being similar to those used for bending tires, except that for the flat rolls of the tire bender are substituted rolls whose shape



A HANDY PLOW-BOLT HOLDER.

conforms to the shape of the section to be handled. In manufacturing work the bending is generally done on a bulldozer, the dies being made to exactly fit the required section.

#### A Home-Made Plow Bolt Holder. EARNEST PARKER.

We have a very useful tool we call a plow bolt holder. It is made of a piece of  $1\frac{1}{2}$  by  $\frac{1}{2}$ -wagon tire iron 30 inches long with a piece of steel welded to one end and drawn to a chisel point drawing the stock edge-ways. Then forge a good handle on the other end, drill a  $\frac{5}{16}$  inch hole, six inches from the sharp end. It then looks like A in the engraving. Then take a piece of stock 1 by  $\frac{3}{8}$ -flat iron 7 inches long, bend in middle, making it double and then weld it up to within  $1\frac{1}{2}$  inches of the ends. Then drill or punch a hole  $\frac{1}{4}$  of an inch from ends not welded and spread these apart  $\frac{1}{2}$ -inch or so it will pass over the large piece and bolt to it. Then turn the welded end in hook shape until it looks like E. When bolted together the tool looks like C. By hooking this over the share when the plow is turned over and the sharp steel end against the bolt head, you can prevent almost any bolt from turning. The plow smith will find this tool very handy in removing and replacing plow shares.

#### Emery Wheels and Grinders in the Smith Shop.

ROBERT SUTHERLAND.

I feel it a duty to say a few words in regard to the placing of emery wheels and grinders in the shop. By way of warning, allow me to say that it is a mistake to set up an emery wheel in the same room with a drill, lathe, planer or other valuable machine or in a room

where lumber for wood-work is stored and above all do not place it near your gasoline engine. The effect will not be immediately apparent, but that is no redeeming feature of the evil. The fine steel chips and grit which fly from your emery wheel while at work, will slowly but surely wear your lathe out of true. It will grind away at the sides of your planer or shaper, and accumulate on your lumber pile and keep you busy sharpening wood-working tools. Your gasoline engine will inhale volumes of it, and it don't matter how clean and well polished you keep your engine on the outside, the grit will go on doing its deadly work inside.

Room off all your emery wheels and grinding and polishing machines in a well lighted, well ventilated room and if you can afford it put in an exhaust fan to carry the dust outside the building. This method is adopted in all well arranged machine shops and the sooner it is introduced into the smith shop the better for the smith.

The wear on other machines caused by grit from the emery wheel is readily apparent, and the blacksmith will do well to heed the above suggestions as soon as possible. The small cost of rooming off the grinding and polishing wheels will certainly be repaid by the longer life of your machines and their continuous smooth running.

#### Making Rope Knives for the Well Driller.

L. R. SWARTZ.

There are several patterns of rope knives made and in use, but I shall endeavor to describe the pattern which is the most efficient with various sizes of rope, from light sand line to  $2\frac{1}{2}$  or 3-inch drill cable.

##### The Valve Knife.

The rope knife bar should be made of 1-inch square stock and 7 feet long—perhaps  $1\frac{1}{2}$ -inch or  $1\frac{1}{4}$ -inch stock would do just as well. The knife complete is shown at A. About 5 inches from the end raise a good heat and upset the stock. Then flatten one way so as to leave plenty of stock where the holes are made to fasten the guide C and knife blade B. Two  $\frac{5}{16}$ -inch bolts will do for holding the guide. The bolt which holds the blade, I make of  $\frac{3}{8}$ -inch steel pump rod fitted with a thin hexagon tap at each end. Do not cut thread farther back on this bolt than is necessary to just fill the taps. The reason I use this kind of bolt is because  $\frac{3}{8}$ -inch steel pump rod is as strong as ordinary  $\frac{3}{8}$ -inch bar iron and neatness is an item on this job as well as strength. Draw out point of

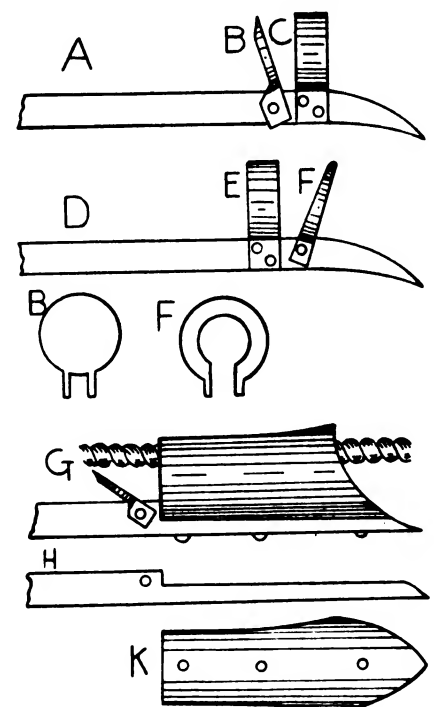
bar as in cut. This knife will pass a splice on  $1\frac{1}{2}$ -inch rope.

##### The Horse Shoe Knife.

The general construction of this pattern of knife is the same as A except that the blade is shaped like a horse shoe and hangs below the guide. This knife will not pass a splice because both blade and collar must be just large enough to pass freely down the rope, otherwise the knife will not cut the rope close to the top of the rope socket. Both patterns require a light pair of jars or links attached to the upper end of the knife bar. Such jars and sinkers were described in a former article on a spud or spear for breaking stone beside tools in the well. These knives are for cutting the rope to make way for fishing tools to recover tools fast in the well.

##### Knife With Long Guide.

This knife is for cutting rope that has been broken below the surface. The knife bar is the same length and of same size stock as for A and D and the knife bar is forged same as A and D except that the lower end is drawn out. The back of the guide is fastened with three  $\frac{3}{8}$ -inch rivets as indicated at G and H. K shows back view of guide, which is easiest made of pipe or casing cut off diagonally and flared at lower end to almost fill the hole. The upper end of



MAKING ROPE KNIVES FOR THE WELL DRILLER.

guide should have 3 or  $3\frac{1}{2}$ -inch opening. The guide should be of such length as to rest upon shoulder of rope within an inch or two of top of rope socket. The rope spear described in a former article will bring out the rope when cut.

# Never Say Fail.

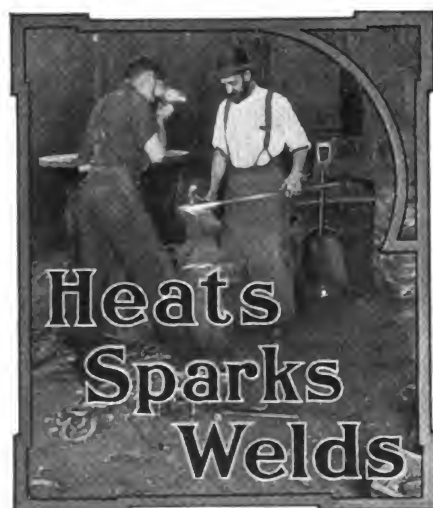
ANONYMOUS.

Keep pushing! 'tis wiser  
Than sitting aside,  
And dreaming, and sighing,  
And waiting the tide;  
In life's earnest battle  
They only prevail,  
Who daily march onward,  
And never say fail.

With eyes ever open,  
And tongue that's not dumb,  
And heart that will never  
To sorrow succumb.  
You'll battle and conquer,  
Though thousands assail;  
How strong and how mighty  
Who never say fail!

Ahead, then, keep pushing!  
And elbow your way,  
Unheeding the envious  
That would you betray.  
All obstacles vanish,  
All enemies quail  
Before the strong-hearted,  
Who never say fail!

In life's rosy morning,  
In manhood's firm pride,  
Let this be your motto,  
Your footsteps to guide;  
In storm or in sunshine,  
Whatever assail,  
We'll onward and conquer!  
And never say fail!



Don't draw the bolts too tight.  
Let a gas engine do your work.  
A Happy New Year to you, and lots of them.

The road to success is paved with sand and grit.

Who stops advertising kills the goose that lays the golden eggs.

Does the engine balk these cold mornings? A stove to heat the air will help.

Tact and persistency will collect more old accounts than a year of law suits.

Whose shop is it? Remember, have your story in before February tenth.

"What do you think of my side-lines?" Asks one smith who is also a druggist.

There's a host of them. Select a profitable side-line if you have any spare time.

Pluck, patience, push and persistence, come pretty near to procuring prosperity.

Boss Yourself you may be some day, or foreman. 'Tis well to look ahead and look alive.

Many horses kick because they have been kicked. A good pair of stocks will save man and beast.

Far better to say little about your work and surprise the customer than to exaggerate and disappoint.

Keep right on. One or two trials won't do. To make advertising pay, you must keep persistently at it.

It isn't worth pushing, if you can't push your business to the front on its own merits. No honest man will belittle his neighbor's business to help his own.

"Take care of the front feet and the hind ones will take care of themselves" says a prominent California shoer.

Make the head save the hand by getting up formers for those jobs requiring a large number of duplicate forgings.

The smith's best friend is a fire. Know your forge, blower and coal and exactly what you can expect of them.

Stop them up! The less money lost through business leaks the greater will be your profit. But first find the leaks.

"I never try to do everything at once", said Thornton when asked how he managed to "keep cool" when rushed with work.

"A penny saved is a penny earned" but it's unwise to spend ten cents worth of time to save a penny's worth of old tire bolts.

An indispensable adjunct to the modern shop is the telephone. A great help and convenience to both smith and customer.

A good time to pick over the scrap heap. Almost sure to find some things of value. But do throw out the rubbish. Throw it out!

A good habit certainly is that of putting aside a certain sum regularly in the bank. It matters not how small. Now is a good time to start.

Keep the snow well away from the shop door. Nothing so irritates a customer as to unhitch in a big drift and then wade through it to the shop.

Don't complain that your paper doesn't come regularly if you haven't sent us notice of your changed address. Give both the old and the new.

Don't stop payments on your life insurance on account of the recent scare. Better hold on and get the benefit certain to result from these investigations.

The up-to-date smith has a special file for his trade catalogues. Do you save yours? Most every one contains something that makes it worth keeping.

An excellent opportunity for broadening your craft knowledge is presented by these long winter evenings. What practical books does your library contain?

Doing anything to induce young men to take up the good old craft? The demand for good smiths grows constantly, while we hear daily of the lack of apprentices.

A fact we've often noticed—the man who says new tools don't pay and he who says advertising don't pay are one and the same person. It's like declaring against progressiveness.

More popular each day—the long-time subscription rates. Save money by taking advantage of them. Shall we quote you our rate for a life subscription? It's a good paying investment.

Describe fully any trouble you are having in your work. It may be a question of treating steel or some shoeing problem, or trouble with a difficult forging. Tell us all about it. We can help you.

Sharpen your pencil and figure out how much more money you would make in a year by a few cents advance in price on each job. Clear profit, too. Now here's a good argument for a raise all around.

What is said will be the largest wagon factory in the world is now being built at Moline, Illinois, to cover 15 acres. The use of cement blocks, instead of brick will effect a saving of \$24,000. Electric power will be used throughout.

A Wealthy Man once publicly remarked, "I patronize no man who does not keep his shop neat and in order." Some people say a man can't do good work if everything is topsy turvy. Confusion of surroundings breeds confusion of mind.

The North Pole, according to some, is a warmer place than many of our northern shoeing shops—To a certain extent cold is unavoidable, but in many modern smithies the trouble is largely overcome, much to the comfort of owner and patron.

Many a good smith has been lost to the craft for the lack of a little pains and patience bestowed on the apprentice. One of the most creditable boasts any smith can make is the number and skill of the mechanics he has taught and trained.

Study the methods of successful men in your line and profit by their experience. "I've learned a lot from my big prosperous competitor since I opened this shop three years ago," said a bright craftsman out near the city line, "and now I have almost as much trade as he has."

'Tis most encouraging to note the recent advancement made by the craft. The light, clean, smokeless, well-ventilated shop is by no means the exception. Many craftsmen use typewriters and the "any-old-scrap" letter head has given way to neat printed sheets. Progressiveness is the order of the day and the blacksmith has not lagged.

Step by step the New York Central Railroad is substituting electricity for steam as power on its smaller branches, and many of us will probably live to see the complete abandonment of the steam locomotive. As a step in the onward sweep of electricity may be noted the fact that Niagara Falls power is to be available for use by March in Syracuse—miles away.

When the talk turned on books and reading matter, down at Tom Tardy's shop the other day, that worthy personage clamly remarked that he never took a blacksmith paper of any kind and never intended to. "I couldn't learn anything from no paper; I know it all now." In our humble opinion, Tom was right—he couldn't learn because he wouldn't. And as for knowing all that the host of bright skilled craftsmen tell about month after month, well, there's no use arguing with such a chap.



### American Association of Blacksmiths and Horseshoers.

Some craftsmen will learn of the American Association of Blacksmiths and Horseshoers for the first time, when they receive this issue of the American Blacksmith and to these craft workers we wish to say:

The primary object of this movement, now some three years old, is to secure a lien law for the craft in every State in the Union. These laws to secure, for the craftsman, the hard earned pay to which he is rightly entitled. Other trades and professions have appealed to their legislatures and received the protection of the law and there is no reason why the smith and his associated craftsmen, if rightly organized, cannot receive similar protection. The American Association of Blacksmiths and Horseshoers is uniting the craftsmen of the various counties into county organizations. These in turn will unite into state associations to use concerted effort at the various state legislatures. The force of combined effort is wonderful and when the object sought is of such material benefit to the craft, not one member of the craft should hesitate to lend his aid and support.

If you desire further particulars regarding this ambitious undertaking address The American Association of Blacksmiths and Horseshoers, P. O. Box 974, Buffalo, N. Y. If you already know about the movement just tell us that we can count upon your support at the coming legislative sessions. In either case write today, before you forget it. It will take but a minute of your time and the benefits to be gained are great. Will we hear from you now? A postal will do.

### A Short Talk on Butcher Knives.

H. CHISHOLM.

North Dakota Agricultural College.

While running the tool fire in a railroad shop where I was a new man, the

master mechanic, who was a practical machinist, kept an eye on the new "tool dresser" and after getting me properly sized up he came up to the anvil and said, "One good tool is worth a whole armful of poor ones." While I agreed with him at the time, I have since thought that if he had said, "Enough poor tools cannot be produced to take the place of one good one," I would still agree with him. There is a sense in which any number of poor tools cannot take the place of one good one. This is as true of knives as of machine tools. In this article I shall repeat some things contained in a short article of recent date



### A PRIZE-PUZZLE PICTURE.

Whose Shop is this and Where is the Owner?

For the best answer and explanation not exceeding forty words in length a prize of Five Dollars will be given. For the second, third and fourth best answers one year's subscription to *The American Blacksmith* each. The conditions are these:

A. Each answer to the above must be accompanied by a statement not above sixty words long, telling what you like best in *The American Blacksmith* and suggesting how the paper can be made more valuable to you.

B. You must be a regular subscriber to the *American Blacksmith* or must subscribe now.

C. Your answer must be in not later than February 10th.

This shop is within a stone's throw of Buffalo's business section, and the picture was taken at a time when the winter's first ice had brought long lines of waiting horses to the doors of progressive smiths in the vicinity.

on the same subject. I shall also confine myself to processes within reach of the average smith.

Many of the craft find that at times business gets dull, and one has to make business. The making of good butcher knives is one of those side jobs which can be done profitably if one understands it. In this article I will give my method as comprehensively as possible.

First, I buy my steel in sizes suitable for different sized knives,  $\frac{1}{8}$  by  $\frac{3}{8}$ ,  $\frac{1}{4}$  by  $\frac{3}{4}$ ,  $\frac{1}{2}$  by  $\frac{7}{8}$  and  $\frac{3}{4}$  by 1. These are the sizes which I find most convenient and are usually sold in one foot lengths. This steel cannot be purchased in small towns, but any jobbing house will be glad to furnish catalogue and price list. I have

never found anything superior to Stubbs' steel for knives, but its price puts it out of the question, unless one is getting a special price for blades. I have used it in making hunting knives and when parties wanted to pay for a superior tool. I also find the Danamora brand satisfactory, though not equal to Stubbs'. In the eastern market, John Firth steel is sold and is good, but, like Danamora it requires more hardening than Stubbs'. There are other brands just as good but each one must make his own choice.

It goes without saying that charcoal is the best fuel for this work, but as most of us do not have that we must

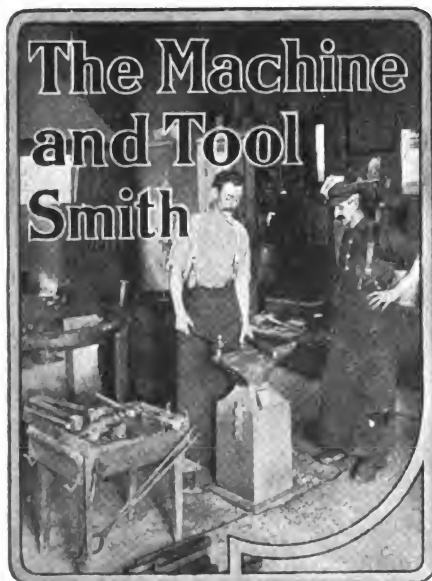
use common blacksmith's coal or coke. I prefer the latter. If a smith manages his fire so as to make plenty of coke, that will do. I have my fire three or four inches deep, and burning freely, but not too hot. For all knives larger than five inches, I weld on a flat iron shank and rivet to the handle with five rivets. For smaller ones I draw down a square tang about two inches long and without taper. For the handles I use brass ferules sawed from brass pipe obtained from junk shops. These ferules are much superior to the very thin ones usually sold at hardware stores.

Even heating, hammering and cooling are essential. I forge as smoothly as possible, so as to do away with much filing or grinding, which is the largest item of expense in finishing, if roughly forged. When forged, I bring to a dull red heat and cool slowly. I straighten off the edges and point with a file. If I do any filing on the sides of the blade I take off all the oxide, as leaving it with spots has a tendency to make it spring in hardening. I make a brand of knives that I do not polish on the sides, but I leave them as they are hammered. Such knives are just as good as bright ones, but do not take the average eye so readily as the polished ones. For tempering, I bank up my fire on the sides with fire brick about six inches apart

so as to make a long narrow fire, and use plenty of coke. Put them in the fire backs down. The heating should be done slowly, especially at the start. For a hardening bath I use raw linseed oil, and plunge at a bright red. For drawing the temper I use a piece of three-inch pipe long enough to project beyond the fire at both ends. This I lay on top of the fire and bring to a red heat on the bottom side. By holding the blade in this pipe and moving slowly back and forth a very even heat is insured.

I also use water for a hardening bath when I have short or thick blades. But in that case I heat to a dull red when hardening. In some respects I find water the most satisfactory hardening bath I have ever used, the results being more uniform. For an ordinary butcher knife I draw to a dull straw color if hardened in oil, and if in water, to a bright blue or purple. The color must depend upon the degree of heat at which the blade was plunged.

For my oil tank I welded a plug in one end of a four-inch iron pipe twelve inches long. This gives sufficient depth with a small quantity of oil. The most profitable knife I have made, and the one in most demand, is from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  inches long by  $\frac{3}{4}$  of an inch wide.



### Hardening and Tempering Steel.—4.

E. R. MARKHAM.

Is Steel injured by forging?

In conversation a few weeks ago, with a superintendent of an establishment where large quantities of tool steel are forged into cutting and various other tools, I asked him what he considered as the effect of forging on tool steel. His answer was, "It improves it wonderfully. We forge everything possible,

even articles that could be turned more cheaply from bar stock, because we think the added expense is more than offset by the improved condition of the steel." This brought to mind a conversation, of several months ago, with an official of an other establishment using considerable quantities of the same metal. When I asked his opinion of this matter he replied that nothing was forged in his shop that could possibly be produced without this operation.

The opinions of the two men differing so widely led me to make a quiet investigation. I found that in the first case narrated the foreman of the forge shop thoroughly understood his business and was well versed in the nature and peculiarities of steel; while in the other shops the most noticeable feature of the man in charge was the fact that he could be hired "cheap".

Many times representatives of steel houses advise against the forging of their steel, not that they do not believe in it but they are afraid their steel will be injured by improper forging.

There is no place in the shop where an inefficient man can be of greater injury to a concern than in the blacksmith shop. When he forges articles from steel he renders it unfit for use by improper heating and hammering. And such steel when worked up into tools, sometimes at a great cost are found to be useless when used. However should the steel be all right when the tools are completed the chances are that he will render them unfit when hardening.

I always feel sorry for the jobbing smith. Under the usual conditions he has a "101 things to do at one time" and in trying to satisfy everyone he satisfies no one. He is heating two pieces for a weld when Tom comes in with a lathe tool to be dressed, Dick brings a reamer that wants hardening and Harry is there with something else that is wanted right away. The smith sticks them in the fire and proceeds with his weld. When he gets this back in the fire he looks at the others. Tom's article must be hardened immediately, Dick's tool is then found to be too hot, and probably the end is burned off Harry's article. In his attempt to look after all these matters he has neglected his weld too long and so the poor smith gets his "calls."

A blacksmith who makes a weld

should not attempt to heat a piece of tool steel for some little time after, as his eyes are in no condition to observe the heats, and tool steel that is over heated is injured. Steel that is forged when unevenly heated is full of strains and is in no condition to harden. Light sections of steel should not be forged with heavy blows from a heavy hammer as this crushes the grain of the steel. Heavy sections should not be forged with a light hammer as the effect of the



OTHER AMERICAN BLACKSMITHS.—A VILLAGE SMITHY.

blow is not manifested much below the surface, this portion being thus drawn away from the interior portion. As the steel cools the blows should become lighter or the grain will be disarranged.

Rapidity is commendable, but when quality is sacrificed in order to save a few minutes when forging, a serious mistake is made. The few minutes saved means a waste of hours when the tool is used. For this reason I always dislike to hear a blacksmith say that he can forge a diamond point tool and harden it at the same heat. I do not say that a good tool cannot be made and hardened at one heat. But I will say that I have never seen one that proved satisfactory when it was used with the others.

Steel that is heated and hammered properly is "hammer refined" and is highly prized by tool makers, for use in making tools that must stand a little more than the ordinary tool.

Many steel makers caution the user against upsetting their steel, because they have learned from costly experience, that some men do not understand upsetting tool steel. Yet I have seen hundreds of pieces of steel upset and made into tools, which after hardening proved to be all right.

In upsetting steel the workman must bear in mind the fact that, at the steel mill in the operations of rolling and hammering, the steel was drawn out all the time and in one direction; lengthwise with the bar. Therefore if the upsetting is not thoroughly done the inner portions will not be seriously disturbed and

the effects of the first drawing will be manifest, while the outer portions have been changed entirely. And when the piece is hardened, the effects of the contraction on a piece of steel whose grain

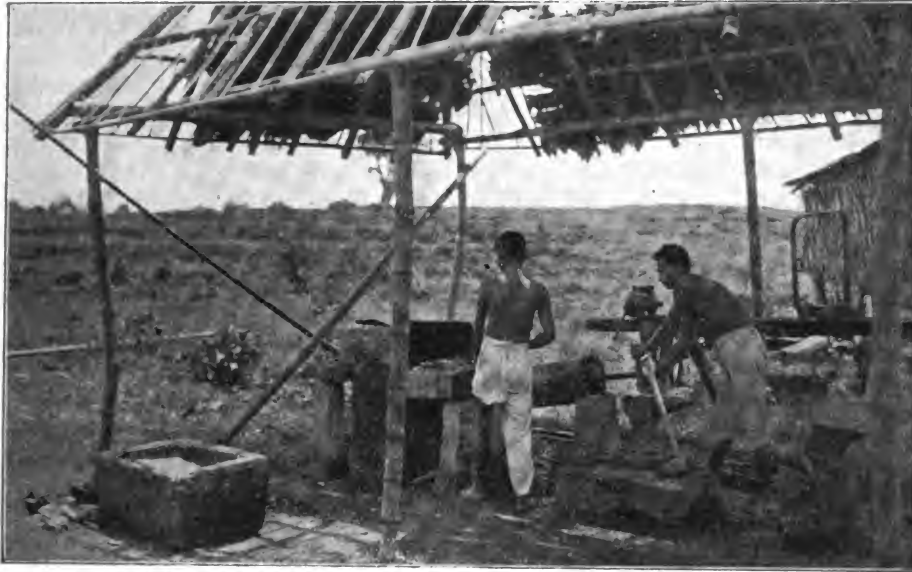
blacksmiths are far more more clever in making their weapons of offense and defense than in any other line of work.

Who would think that the crude sledges, formed by lashing pieces of

respectfully called to that fact. One of the boys might operate the device with comparative ease.

The picture which shows the two smiths working under a somewhat dilapidated bamboo shed illustrates the kind of shop one meets with continually among the more civilized or Christian Filipinos. They have a few more conveniences in the way of anvils, vises and the like, than their Igorrote relatives. But most of them have been acquired since the American invasion of the Islands. As will be seen, the bellows in this picture is replaced by something that looks very much like the apparatus, which in our boyhood days we called a "squirt gun"; in this case, however, air is squirted instead of water. These Christian craftsmen have a somewhat wider range of activity than their non-Christian fellows for they even go so far as to weld broken springs, tires and the like, for the funny little two-wheeled carriages belonging to the wealthy families.

Except in the Quarter Master's department of the United States Army, horseshoeing is an art about which little is known in the Philippine Islands. The only horse which the Filipinos have and use is a little stunted pony with flinty feet which never seem to mind the rough roads. Small as they



THE FILIPINO HAS YET TO LEARN THE VALUE OF A MODERN PORTABLE FORGE.

at the center lies in one direction while that at the surface is in the opposite, can readily be imagined. Whereas, the same piece of steel if thoroughly upset would not give any trouble when hardened, provided it was handled properly.  
(To be continued.)

#### Other American Blacksmiths.

GEORGE C. VEDDER.

How many modern smiths working with all the most up-to-date appliances ever stop to realize what the beginnings of the craft were? A glance at the accompanying illustrations will perhaps open the eyes of many to some of the benefits of our living in a country so far advanced as the United States. After Dewey had startled the world in Manila Bay and the United States entered into possession of the Philippine Islands it was found that we had become the guardians of many curious and strange people, chief among whom are the Igorrotes, one of the largest non-Christian tribes in those islands. Backward as these people are in most things they show traces of civilization for they have their farmers (chiefly women), their miners and in an elementary sort of way their craftsmen. The range of the Igorrote blacksmiths accomplishments is not very large; in fact they have little use for iron, except in making crude knives, spear-heads and battle axes, chiefly the latter, for many tribes of these genial people are "head-hunters". It is easily comprehended therefore that these strikingly attired

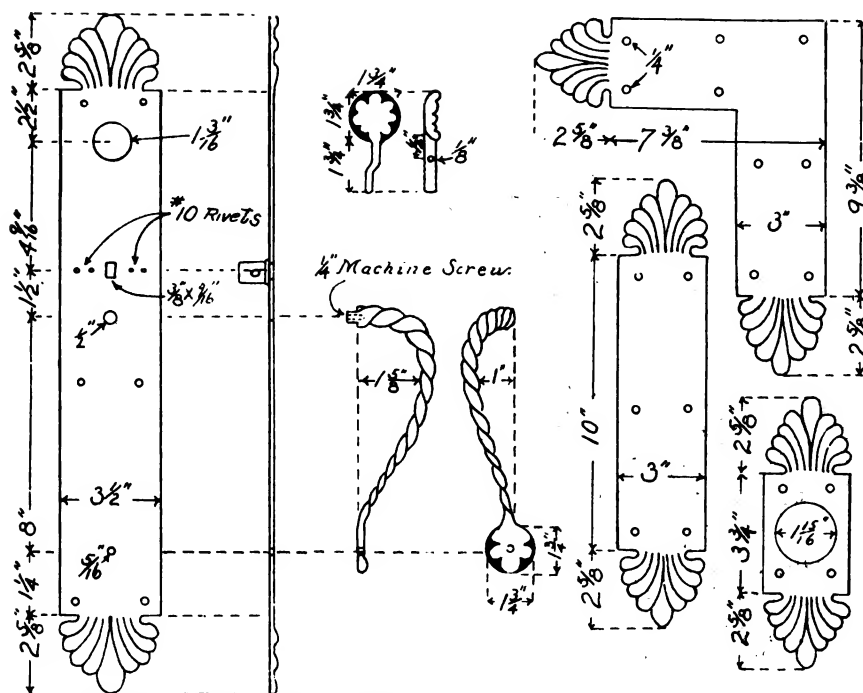
bamboo to cobbles could be used for fashioning spears and axes, which are greatly sought by tourists in that part of the world? The two hollow logs standing upright, each of them provided with a piston which are operated alter-



THE SMITHING CRAFT IN THE PHILIPPINE ISLANDS. THE IGORROTE SMITH

nately to provide something approaching a continuous current of air, are not patented as far as we can ascertain and the attention of Tom Tardy is hereby

are, it seems doubtful if any readers of the AMERICAN BLACKSMITH would care to tackle the job of shoeing one of them. For having grown old in their ways they



SHOWING THE PLANS FOR MAKING THE WROUGHT IRON DOOR PLATES.

object very strenuously to any such innovation as having iron nailed into their feet and express their objections in a way that has left an impression on the minds and in some cases on other parts of the brave and foolish men who have tried the experiment.

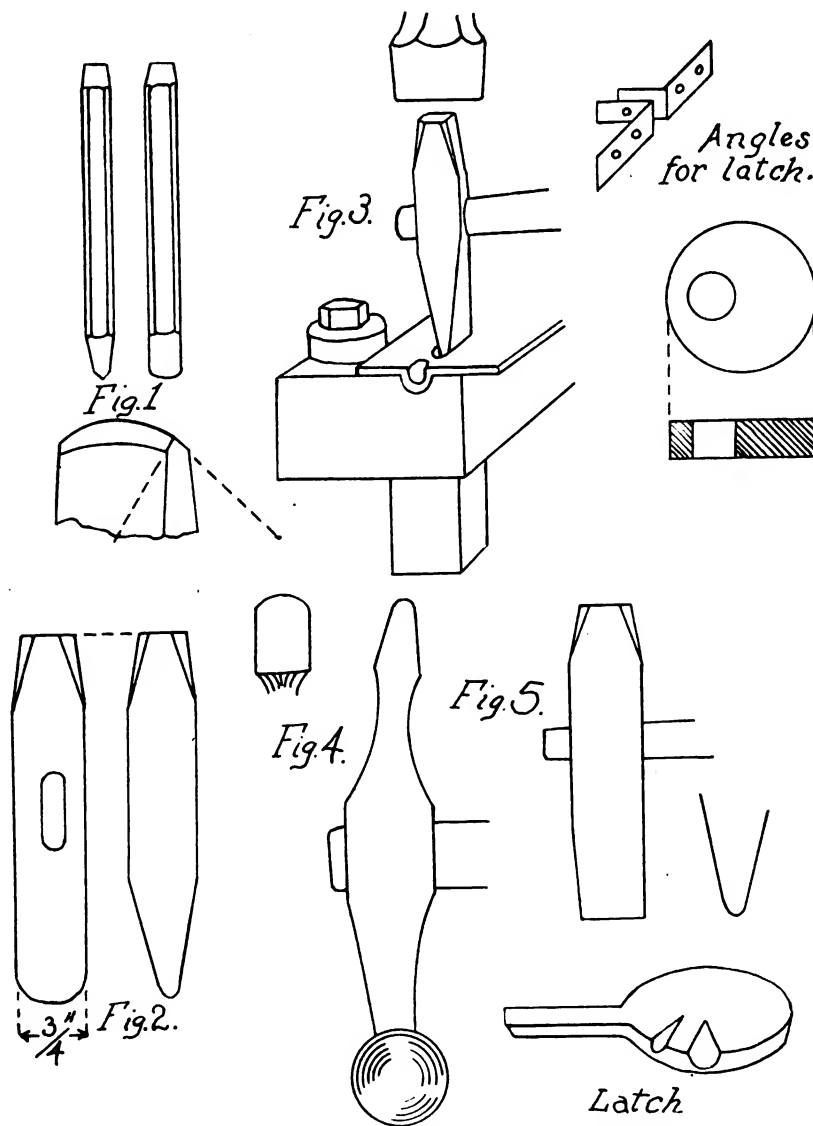
**Hand Wrought Iron Door Plates.**  
**THOMAS GOOGERTY.**

In the last few years, ornamental wrought iron work, as a means of decoration, has become an established feature of architectural work. In small things, such as may be used in the interior decoration of the home, there is no limit to the beautiful pieces that may be executed by one skilled in this branch of work. To those interested in this work, I will endeavor to explain how to construct a set of outside door plates. The first thing in order would be to find out the thickness of the door, so as to forge the thumb latch the right length. You ought to know whether the door swings to the right or left, also have the electric push button, so the plate may be drilled to suit it. You may fasten plates on the door with round head screws, or a forged nail would be very appropriate.

To construct the plates take a bar of soft steel, 10 inches wide and  $\frac{1}{8}$  of an inch thick. Cut the corner plates 10 by 12 inches and 3 inches wide, grind and file smooth on the edge, so that they are perfectly square. Cut all of the plates at the same time (note dimensions in engravings.) When you have all of them straightened and smoothed up, cut a paper pattern of the decorated

ends and trace around it on the plates with a slate pencil. Now drill two  $\frac{1}{8}$  inch holes in each end, where the decorated ends spring from the plates. Next trace around on your slate pencil marks, with a curved cold chisel. When all traced, heat the ends and cut through from one side. When cutting lay a piece of soft iron on your anvil, so you will not destroy the edge of your chisel. When this is all done you will have, if careful, a bevel all around the ornament. Use the beveled edge for the face side of your plates. You may true them up a little with a half round file.

Now notice the veining in the finished ends. To do this, sketch the lines on the plate being careful to have a graceful curve, also have them symmetrical. Trace all of the ends at one time. Now use a short, dull, cold chisel, four or five inches long, and about  $\frac{3}{4}$ -inch wide. Grind it with a short bevel, and instead of having it straight across make it slightly round as shown in Fig. 1.



THE VARIOUS TOOLS USED IN FORGING THE WROUGHT IRON DOOR PLATES.



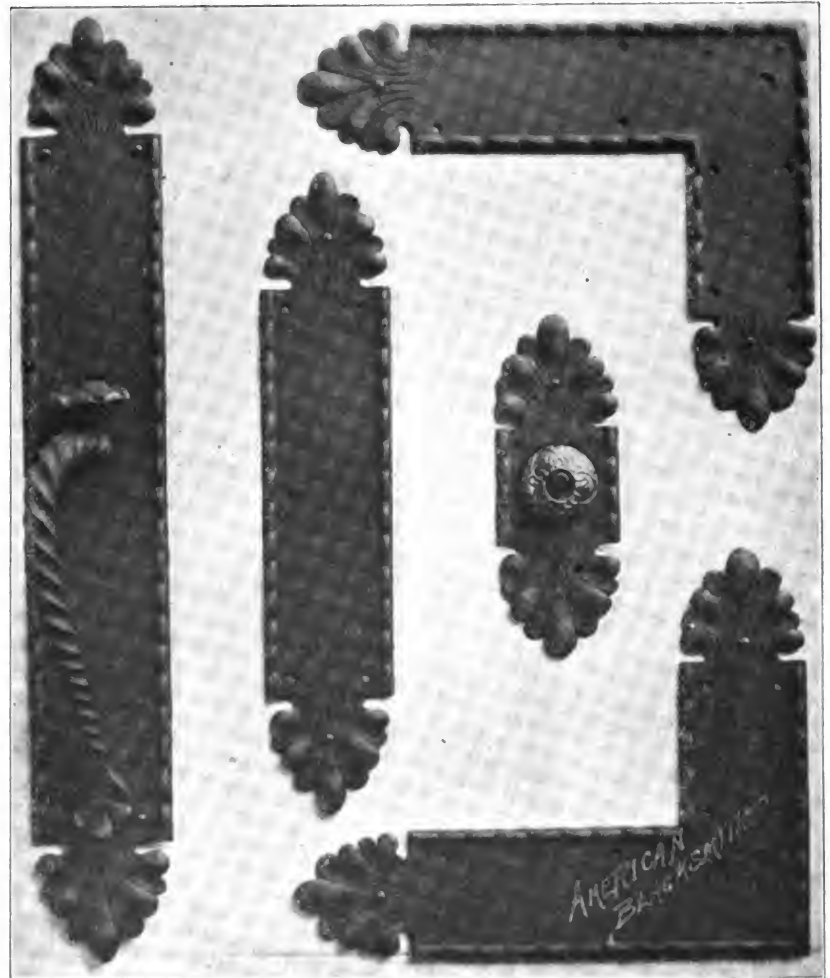
With this tool and a hand hammer, you may trace over your pencil mark. Do this cold. When this is all done nicely, and you are satisfied with it, and think you cannot improve it, you may raise the bead moulding along the edge of the plates. To do this you will have to make a tool (any rough kind of a tool will do) out of soft steel—it will do as well as hard. Forge it the same as a bottom swage, to fit the square hole of anvil, making it about  $1\frac{1}{4}$  inches high, and about three inches square. Then make a sink about  $\frac{1}{8}$  of an inch wide, and the same depth. Do not make it in the center of piece, but to one side, towards the end of anvil. You will need more stock on the side near the horn to put a gauge. Now drill a hole on that side near the edge for  $\frac{3}{8}$ -inch cap-screw and turn an eccentric washer, about  $\frac{3}{8}$ -inch thick, and run cap screw through it into swage. By turning this washer it will move the plate a little so as to get bead just where you want it, then tighten the cap screw so the washer cannot move. You will also need a top tool. Just take a piece of hard steel,  $\frac{3}{4}$ -inch square by  $3\frac{1}{2}$  inches long, and punch a long hole in it, like the eye in any top tool, draw down one end of it like a small fuller, and round it nice and smooth. Heat the plate, laying it on the die, and have a striker drive this tool into it, as shown at Fig. 3. See that it is working right before you put it on your work. It will have to be filed just right as you may get it a little big and cut through: when it is right go along the edge with uniform spaces.

When you have the moulding all raised, heat the ends and raise the part in between the veins. Notice that they alternate, one is raised, and one flat. Start with the center first and hammer from back side with a hammer like the one shown in Fig. 4. Use both ends of the hammer—ball where it is wide, pein in the narrow places. Do this hammering on a block of elmwood about 10 inches in diameter and 3 ft. long. Heat the part to be raised, set it on the end of the block and hammer it good and hard. As the metal is quite stiff, the wood will burn from under it, and each blow of the hammer will sink it down into the block, thereby, raising that part in relief. After the end is raised, heat the whole of it red hot and laying it on a surface plate (raised part up), use a wooden mallet, sharpened like a hatchet, and hammer in between raised parts to get them down flat. When cool you can help the looks a little by using a half round file. Now drill all the holes as shown in engraving.

To forge the latch, use a piece of soft steel,  $1\frac{1}{2}$  by  $\frac{3}{8}$ -inch, draw out the shank  $\frac{1}{2}$  by  $\frac{1}{8}$  inch and round up thumb piece  $1\frac{1}{4}$ -inches round. Notice piece and tool at Fig. 5. This tool is just like a fuller. Heat the piece, setting this tool on and drive it down all around edge as shown in engraving. Then use a file and round it on the bottom, and smooth up fuller marks. Now drill  $\frac{3}{8}$ -inch hole,  $\frac{1}{2}$ -inch from thumb piece. Now make two little angles from stock,  $\frac{1}{2}$  by  $\frac{1}{8}$  inch and drill holes to receive the latch, as at A. Rivet them in place on

the rest, have a can of water with drip hole and let a little water run on that part. Repeat operation until done. To form it, screw a piece of hard wood (say, 2 inch round,) in the vice. Now heat the handle at large end, getting your heat about where you want to bend it, lay it over the piece of wood and with a mallet, hammer it into shape. Throw the handle to one side, by twisting the bottom part a little. Twist nowhere else except on the tenon on large end, this will be thrown over a little.

To forge this tenon, cut handle off the



ORNAMENTAL WROUGHT IRON HAS BECOME AN ESTABLISHED FEATURE OF ARCHITECTURAL WORK.

back of plates, insert latch in place, and rivet it. To forge the handle, use a piece of  $\frac{3}{8}$ -inch square soft steel and cut it sufficient length. Upset one end large enough to make bottom end, round it up, and draw handle on a taper as shown in engraving. Then twist it from top end, (as this is the largest it should be twisted first) being careful to twist it uniform. In order to do this you should have an even heat, then screw large end in vice, using a monkey wrench on the other and twist it to the right. If any part twists faster than

right length and round it up with a swage, using a file in the corners, so it will set in hole of plate just right. Have it long enough to rivet cold. You should have some copper jaws for your vice, so you do not mar the twist of the handle. After drilling a hole in the bottom end, rivet the handle in place. Then drill a  $\frac{3}{4}$ -inch hole into the handle from the back side of plate and taper this hole out for a  $\frac{1}{4}$ -inch machine screw, to be used to fasten plate on the door. Paint with Ivory Drop Black ground in Japan, using oil to bind.

These plates are for a number 1347 Corbin front door lock. The plate on the inside of door, may be shorter than the one on the outside. You may

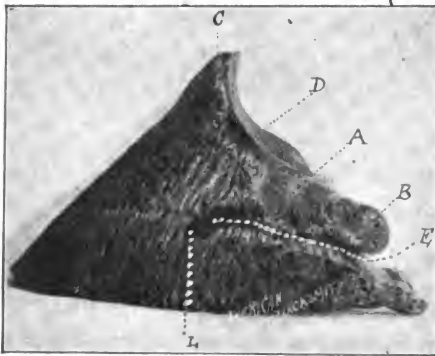


FIG. 1. A, INSERTION OF THE LATERAL LIGAMENT OF THE OS CORONAC. B, ATTACHMENT OF LATERAL CARTILAGE. C, PYRAMIDAL EMINENCE. D, ARTICULAR SURFACE. E, PREPLANTAR FISSURE. L, PREPLANTAR SINUS.

also use an ornamental bronze or brass latch on the inside and use black iron on the outside of the door.

### The Bones of the Foot.

E. W. PERRIN.

The bones of the foot are the foundation upon which the hoof is built. Looking at Fig. 1 it is apparent that the hoof, with the exception of the heels, partakes of the shape of the bone called the os pedis bone or coffin bone, in fact the hoof, is so to speak, moulded upon it. The only formation between it and the hoof on its anterior and lateral sur-

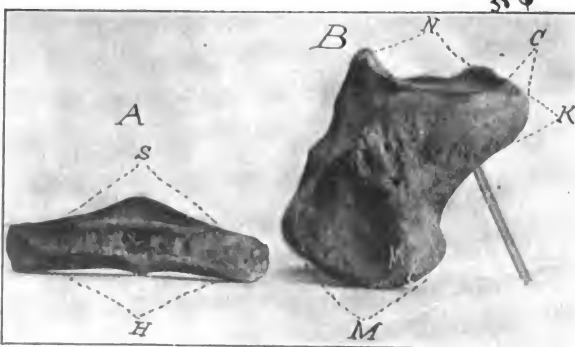


FIG. 2. SHOWS NAVICULAR AND OS CORONAC. A, S, ARTICULATORY SURFACE. H, INFERIOR SURFACE. B, N, ARTICULATORY SURFACE. C, ATTACHMENT OF THE INFERIOR CORONARY LIGAMENT. K, SURFACE OR PULLEY FOR PASSAGE OF THE PERFORANS. M, ARTICULATORY SURFACE.

faces is the sensitive laminae, and on its solar or inferior surface, the sensitive sole. These two structures are so thin however that they take up but very little space. The bones of the feet are three in number; the os pedis Figs. 1, 3, and 4, and the os coronary and navicular bones Fig. 2. Only the lower half of the os coronary is situated within the hoof, the upper portion stands above the coronet.

I desire to especially call the attention of the horse-shoer to the wonderful mechanism of the internal structure of the feet. If the shoer would only take the trouble to dissect a foot, the internal structure is so wonderful that it surely would interest him and encourage him to investigate further. The os pedis is a study in itself. Look at Fig. 1, it reminds one of a piece of pumice stone. You observe innumerable holes. Every one of these and the furrows has a purpose, nature has allotted to each a function. There are a great many more holes in the surface of this bone which you cannot see without a magnifying glass. Into each of these enters a nerve filament. Now look at Fig. 3 which shows three vertical cross sections of the os pedis. If you saw through a coffin bone, you will find its external surface very hard, but all within this outer layer, (which shows as a white line in Fig. 3) is softer and simply honey-combed with very fine holes. In the middle of the bone there are a number of little tunnels and passages leading in every direction. Continuations of the plantar sinuses which carry the main branches of the plantar arteries are marked XX Fig. 3. The continuations of the pre-plantar sinuses, which carry the branches of the pre-plantar arteries are marked OOO Fig. 3. All of the holes as seen on the external surface in Fig. 1, lead into the middle of the bone and an ordinary pin may be buried in many of these holes.

At A Fig. 1, is the insertion of the lateral ligament of the os coronary, B is the attachment of the lateral cartilage and C is the pyramidal eminence into which is inserted the tendon extensor pedis. Now let me call your attention to the solar or inferior surface of the os pedis, Fig. 4. The irregular semicircle EE is called the semi-lunar crest. This is the insertion of the great flexor tendon of the foot, flexor perforans. At this part the tendon is broad and flat and firmly knitted into the bone the remainder of the surface being covered with a thin velvety tissue, the sensitive sole, which secretes the horny sole.

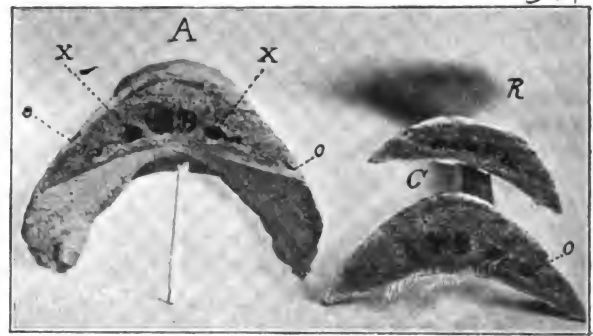


FIG. 4. VERTICAL CROSS SECTION OF THE OS PEDIS. A, POSTERIOR HALF. XX, CONTINUATIONS OF THE PLANTAR SINUSES. OOO, CONTINUATIONS OF THE PREPLANTAR SINUSES. C, MIDDLE CUT. E, POINT OF TOE.

Now take a look at Fig. 2. A, is the navicular bone, the roughened depression showing a number of little holes, lies close up to the os pedis and is held in its place by ligaments. Its superior surface S lies close up to the inferior surface of the os coronary, thus forming part of the coffin joint, while its inferior surface H forms a pulley over which the great tendon, flexor perforans, glides. The os coronary or short pastern bone is shown at B Fig. 2. The inferior surface M, articulates with the os pedis and navicular bone to form the coffin joint, while the superior surface N, articulates with the lower end of the os suffraginis to form the pastern joint. The posterior surface K, (not shown in this engraving) is covered with cartilage, presenting a wide smooth surface as a pulley for the passage of the flexor perforans. C is the insertion of the coronary ligaments. The opposing surfaces of the bones are covered with articular cartilage, which presents a beautifully smooth surface and each articulation is enclosed in a thin band, capsular ligament, the internal surface of which is covered with a synovial membrane, which secretes synovia-joint oil to lubricate the joint.

Knowing as I do that the study of

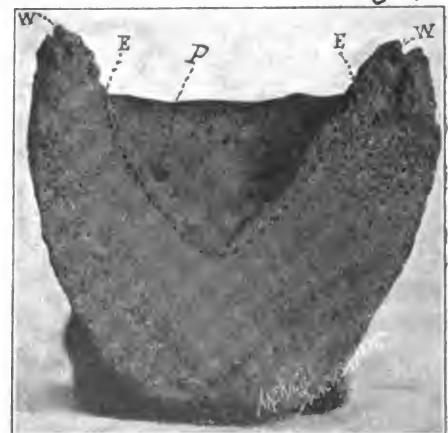


FIG. 4. THE BONES OF THE OS PEDIS. W W, WINGS OF THE OS PEDIS. EE, SEMI-LUNAR CREST. P, PLANTAR FARAMAN.

anatomy is indispensable to the science of horse shoeing, I urge my readers to inform themselves of this important branch of their profession. Remember that some of your customers are readers. See what an embarrassing position it places you in when one of your customers asks you something about horses' feet, and finds, much to his disgust, that you know nothing about it. Get a dead foot and a text book and spend your spare evenings cutting the foot apart. Dissect it piece by piece. Put your specimen in a solution of bi-chloride of mercury, or carbolic acid, strong enough to prevent decomposition, and you can work at it nights and in spare time for weeks without any unpleasant odor.

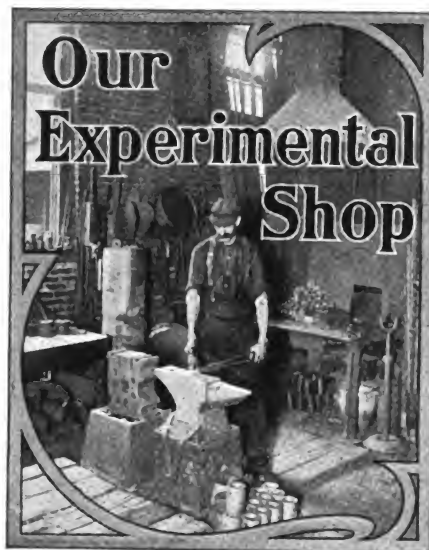
### To the Young Man Learning the Horseshoeing Trade.

DANIEL FERRON.

Young man, if you want to learn the horseshoeing trade and become a skilled horseshoer, you must commence right. After you have engaged with a blacksmith from whom you intend to learn your trade ask him where his horse's feet are. Tell him you would like to see the inside of a horse's foot so as to have a better understanding of how to go to work on it. Probably he will tell you he hasn't any and perhaps he never saw the inside of a horse's hoof himself. Now don't think I am going to encourage you to disobey your boss, but, in this case, you get all four feet from the first dead horse you hear of. Cut them off at the knee. Bury one foot and leave it until all the flesh is gone from the bones. Take another one and put it in a kettle and boil it until all the flesh comes off. Take the third one and cut off at coronet joint. Then saw it in two lengthwise through the center of the frog. Cut the fourth one off at the pastern and cut the frog out. Then cut the sole out all the way around close to the wall. After you have removed the sole you can see the sensitive part of the foot, toe bone, and navicular joint and the coronary joint. You can also see how the ligaments and tendons that run down the leg are connected around the navicular joint and how your nails should be driven without pricking or injuring the foot. It will also give you an idea of how thick the sole is. But you must remember that all horses do not have the same thickness of sole. You will learn this by practice. And always be careful in practicing to feel on the sole with your pincers to see whether the horse has a thick or thin sole. Some are so thin and light that you can spring it with your thumb by pressing on the bottom.

I shall now say just a word in regard

to paring the foot or getting it ready for the shoe. To pare the foot properly is one of the most important parts of horse-shoeing. In the first place, never dig out or cut the bar which is back at the heel. One of the reasons that so many horses have corns is that many smiths do not know what the bar is there for and they cut it or dig it out, taking the support of the wall all away from the heel of the foot and letting the wall break down. The shoe then rests on the sole and in a short time the horse will have a corn.



Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

To the water, in which paint brushes are kept in winter, should be added a little glycerine. This will not injure the brushes in any way and will keep the water from freezing, thus saving the painter considerable annoyance.

"In winter, I am always careful not to cut the horse's feet down too close" says an old-timer. "The animal gets cold feet just as well as a man and as the former has no warm boots to protect him from the cold, we should allow nature to aid the animal as much as possible. It's bad enough to have cold irons attached to his feet without cutting all his natural protection away."

A prominent Western smith has this to say about the bad practice of rasping a groove or furrow around the hoof at the clinches. "This under-rasping is indeed bad and not only do some men rasp the wall of the foot, but they also rasp the nail and thus weaken the clinches. I use a little gouge, about four inches long, to remove the little bar. The cutting edge of this tool is hollow or curved and about the size of a number seven nail. With this gouge the bar is cut under the clinch and there is no weakening of the wall or hoof injury."

"Now is the time to clean out the chimneys of the shop, if you have not already done so" said a smith who dropped in the other day. He is well and widely known for his carefully kept shop. "The doors and windows are closed most of the time in winter and nothing adds to the discomfort as

much as a badly drawing chimney. A good way to clean it out is to work a large chain up and down the sides of the chimney until all soot and dirt is loosened and falls into the forge, when it can easily be removed."

One of the boys has been the envy of the whole shop for the rapidity with which he cleaned his hands and the rest were very anxious to know the secret. Jim then gave them the following formula: take a generous amount of good soap powder and add an equal quantity of sawdust and half as much white sand. This is mixed thoroughly and rubbed over the wet hands, when it may be rinsed off easily in either hot or cold water. When the hands are especially greasy, they may first be scrubbed with a hand brush dipped in kerosene.

An alloy for filling holes in iron or steel sent in by a Massachusetts smith is made and used as follows: Melt together 9 parts lead, 2 parts antimony and one part bismuth and pour this mixture in the hole in its molten state, first warming the iron a little. This alloy possesses the peculiarity of expanding while it cools, consequently it tightens as its temperature falls.

That anti-freezing solution for gas engine jackets is proportioned as follows: Four pounds of chloride of lime to each gallon of water will form a solution that will not freeze at 17 degrees below zero, 3½ pounds to the gallon at 8 degrees below zero and 3 pounds to the gallon at one degree below zero. This solution has a very slight if any effect upon the walls of the cylinder, pipes or tank and can be carried in solution from one season to another. It doesn't form a sediment in the tank. The chloride of lime is sold in hard, stony cakes, chunks or crystals and may be purchased at about one cent per pound.

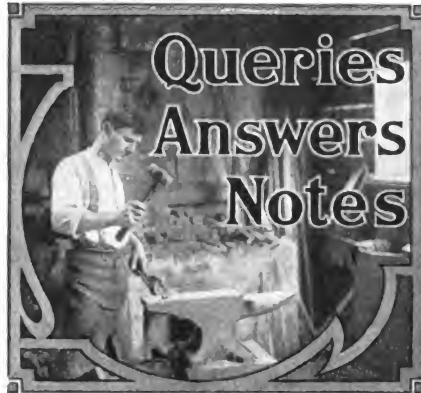
A good cement for attaching rubber bands to band-saw wheels is made as follows: Place together in a tight jar one part powdered shellac in ten parts of ammonia water and let stand for about four weeks, when the mixture will be ready for use. This cement can also be used in other cases where soft rubber is to be fastened to iron.

One of the boys finished a steel rule very neatly as follows: The scale was first varnished very lightly, care being taken to get into all the cuts. When dry a varnish made of lampblack and shellac was applied so as to fill all the cuts. This was then allowed to stand until thoroughly dry and then the superfluous varnish was polished off until only the graduations remained. This shows the marks up very distinctly and gives the scale a very fine finish.

"Since we have discontinued the use of steel nuts," remarked a jobbing smith who dropped into the shop the other day, "we make them of iron, by using square stock and then scarfing them so they must be welded on the horn of the anvil. In scarfing them the other way they almost always break in the weld when shaping up. We use a mandrel, the size of the blank nut and use a 'hex' bottom swage for finishing."

"There are no iron bound rules to lay down for the government of the painter in choosing and treating colors for business wagons," says a veteran of the craft. "Apparently, at present, the painter is to a great extent a law unto himself in respect to these matters. His chief aim is to unite

and treat combinations that do not offend, while at the same time serving to call conspicuous attention to the wagon owner's business. The relief scrolls and the ornate shaded ornaments which formerly prevailed are now conspicuous by their absence. Neat, legible lettering, and striping and ornamental effects of the simpler pattern, but drawn with accuracy, are now universally adhered to. This, with the carefully studied choice of colors, and the artistic handling of the combinations, is the painter's chief duty in painting the business wagon—in the painting of all vehicles, let us say—and by holding fast to this practice he will not depart from the prevailing style."



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**Melting Brass.**—In answer to John Tiekling's query regarding the melting of brass will say that he undoubtedly does not heat it sufficiently. If he will bring his brass up to a heat of about 400 or 500 degrees Fahrenheit he will find it to run very nicely in small boxes. **BRASS.**

**The Size of Wood Screws.**—In answer to B. C. who inquires regarding the size of wood screws would say that as far as I know the number of threads has nothing to do with their length and size. Of course the number of threads must be rightly proportioned to the length and thickness of the screw. **B.**

**Wants to Know How to Figure Stock.**—Will someone please tell me how to figure the amount of stock necessary to make a ring of any diameter and of any size stock by bending the stock on its edge? I would like to know so I can simply bend my stock and weld, and produce a ring of the required size. **G. W. MALLETT.**

**Fever in Horses' Feet.**—In answer to Mr. O. W. Taylor's query in regard to heat in horses' feet will say that there must be some vital reason for the feverish condition. Poultices of one kind or another will allay the fever temporarily, but when the heat returns you may be sure that there is something vitally wrong with the feet. **C. A. B.**

**Tools for Cutting Chilled Rolls.**—In answer to brother W. M. Champion's query in the November issue will say that if he makes his lathe tools out of high carbon alloy steel he will find them to work better than a straight carbon steel. If it is desirable to run at very high speed use a self-hardening steel. As to hardening his tools he will need to use his own judgment outside of the general

directions with which every tool smith is well acquainted. **A. C. B.**

**An Interfering Horse.**—In answer to brother S. J. Pemberton who asks what to do to prevent a horse from interfering in front would say that outside weights on both front shoes will undoubtedly overcome this slight defect. However if the animal is narrow chested he will probably need to use some other treatment. **SIDE-WEIGHT.**

**Curing a Case of Ring Bone.**—Brother F. S. Evans asks in the October number how to cure ring bones on a colt. I will tell him of one way to cure them without leaving a scar or making a sore. Take a bar of solder and bend it round so it will fit nicely just above ring bone and leave it on till the ring bone disappears. Ring bone is caused by a leakage of the joint and the weight of the bar of solder will gradually force this leakage back into the joint. It takes some time this way but a nice smooth job will result. I believe this better than medicine, but it is perhaps not as quick. **D. M. LOVE.**

**An Interfering Horse and Steel Stocks.** I would like to ask through your paper which method is best to stop a horse from interfering. He toes out with front feet and strikes up near the knees.

I would also like to find out the address of a firm in the United States who makes a horse stock something like the Barcus, but the frame is of iron or steel. There are four clamps on it and it works with levers instead of cranks. Any one answering this through the paper will be doing something to help along his brother craftsmen in the trade. **FRED DAVISON.**

**A Water Proof Glue.**—We have occasion to use a water proof glue. Would you be kind enough to let us know of some good receipt? **I. POWER AND SON.**

**IN ANSWER.**—A very superior article may be made by dissolving 3 parts of india rubber in 30 parts of naphtha; heat and agitation will be required to effect the solution. When the rubber is completely dissolved, add 64 parts of finely-powdered shellac, which must also be heated in the above mixture until all is dissolved. This mixture may be produced in sheets like glue by pouring it while hot upon plates of metal, where it will harden. When required for use it may simply be heated in a pot till soft. Two pieces of wood or leather, joined with this glue, can scarcely be sundered without a fracture of the parts. **V. B. G.**

**He Answers Several Questions.**—In answer to Mr. John Tiekling, after your brass is melted heat it, to from 300 to 500 degrees. You will then find it to run better. Brass, iron or steel is not hot enough to run in the mould at the melting heat. Try your brass this way: Plunge a  $\frac{1}{8}$  or  $\frac{3}{8}$ -inch iron rod in your brass after it is melted. If brass sticks to it, the brass is not hot enough. Heat it until iron comes out clean. If you put a little aluminum in your brass it will help it some.

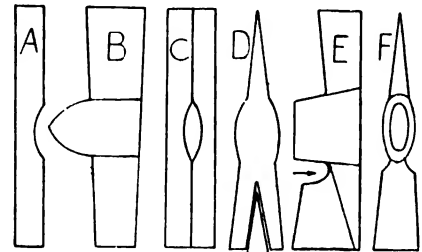
Answering Mr. John W. Russell; you can make iron forms for certain kinds of castings such as sash weights. But you cannot make moulds that take longer than one heat. The reason is that the casting will shrink  $\frac{1}{4}$  of an inch to the foot. Strong moulds would not permit the iron to shrink and the result would be a broken casting. To melt iron in a crucible is very expensive as it takes from 2  $\frac{1}{2}$  to 3 hours to melt it.

The cheapest way is to make a little cupola. Then you can melt 3 to 4 gallons of iron in about 15 minutes.

In October number, on page 12, I noticed what Mr. C. H. Richardson said about steel and iron 10 to 15 percent. carbon and 40 to 80 percent. in tool is rather high in carbon. I would be a little afraid to work that kind of steel in tools. I suppose he means 40 to 80 points or  $\frac{1}{2}$  of one per cent.

**CHAS. HELLMINGER.**

**How to Forge a Grub Hoe.**—Mr. W. H. Moss, Jr. asks some one to strike for him while he forges a double bitted grub hoe. Well, I'll put on my apron and then to business. Take a piece of new wagon tire  $\frac{1}{2}$  by 1  $\frac{1}{2}$  inches and forge it as at A. Make two pieces right and left and form them as at B. Then place them together and weld



**HOW TO FORGE A GRUB HOE.**

the ax end down as at C. Now, open the eye just about half way as at D and insert a piece of the same stock as a wedge and weld. Now fuller it as at E and forge to the required thickness and width. The completed hoe is shown at F. Of course you will use stock best suited to the sized hoe you desire to make. The above stock will make a hoe that will weigh 5  $\frac{1}{2}$  pounds and be 2  $\frac{1}{2}$  inches wide. **E. H. FUNCK.**

**Dividers or the Tire Wheel.**—In the November issue, of our favorite craft paper, on page 40 I find an article regarding tire setting in which I felt quite interested. I like the spirit in which the piece was written and also the motto of honest work, but the writer will please pardon me for a difference of opinion in regard to setting tires. I think it much better to set them cold if you have the right machine to do the work. A man who wants to do honest work will do it with a cold tire machine as well as with the tire wheel, shrinker hammer, cooling tub, etc. I have made tire setting a special study for the last seven years and to speak from experience, will say, to set them hot is a matter of guess work, as you have to guess at the amount of draw it will take to make every joint tight and still leave the wheel with the proper dish. Cutting the ends of the spokes is all right if not cut too much, in which case it injures the rim. Most wheels, which have not been run loose too long, do not need cutting off nor wedging. I can tell at a glance when a wheel needs the spokes cut or wedged and always attend to it and then save time, fuel and labor by setting them cold. In the first place a tire does not need to be drawn so much when set cold as when set hot, as there is no water to dry out nor is there any charred wood to wear away. The worst thing one can do is to set a tire too tight. It always ruins the wood-work. I claim that cold tire setting is no longer an experiment but a success. I have a Brooks Cold



Tire Machine and set over 300 tires in the last four months without any complaint from any customers. We must do good as well as honest work. ED. WITTNER.

**A Believer in the Bar Shoe.**—I have a shop with two fires. Have a Western Chief drill and a large outfit of special dies, taps and small tools, as my work here runs largely to machine work on oil drilling outfits. I also have a fine shoeing trade and am a firm believer in a properly applied toe clip and in a bar shoe for every sort of lameness, not of a nature to cause pain in the sensitive frog or an inflamed tendon where it will be hurt by frog pressure. One not accustomed to a bar shoe's uses will be greatly surprised at the quick results where contracted heels, founder, full footedness and corns are concerned, and with many cases of soreness of coffin bone and heels. P. P. GREENE.

**A Short Talk on Horseshoeing.**—I wish to say a few words on one or two great mistakes that some of my brother smiths make. First, they will not shorten the feet from the bottom and set the shoes out flush with the toe. But instead they take a shoe one or two sizes too small and cut the foot down to make it fit the shoe. I say any man that does this should not be allowed to shoe horses. And furthermore I hope to see the time when every man will be obliged to pass an examination before he is allowed to shoe horses. There are men running shops today that know nothing whatever about the nature of the horse's foot, and they get work simply because they do it cheap. I hope such men will soon be stopped ruining so many noble beasts. E. A. L.

**Browning Gun Barrels.**—Browning is done for purpose of subduing the bright light on the barrels which is likely to arouse game, to bring out the fibres of the metal, to show its form and beauty, and to protect it in a measure from rust.

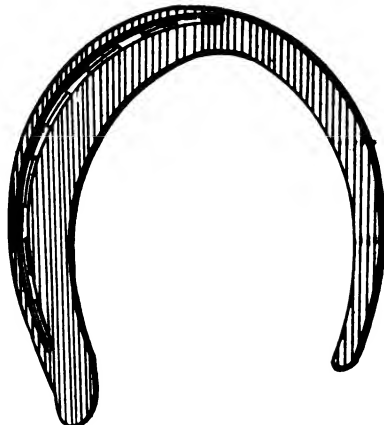
The preparatory process consists of producing a very thin uniform film of rust, or oxide, upon the iron and giving a gloss to its surface. The barrel having been polished bright is rubbed with lime to remove all grease. Plug both ends of the barrel and use plugs to handle with, as the browning fluid will not take where the fingers touch. Clean the work with fine emery cloth and apply the following solution with a sponge tied on a stick. Keep the fingers out of it as it is very corrosive. Put in a glass vessel spirits of nitre,  $\frac{1}{2}$  ounce, tincture of steel or unmedicated tinct. of iron  $\frac{1}{2}$  ounce, black brimstone (crude brimstone)  $\frac{1}{2}$  ounce, blue vitrol or sulphuric acid C. P.  $\frac{1}{2}$  ounce, corrosive sublimate  $\frac{1}{2}$  ounce, nitric acid one drachm, copperas  $\frac{1}{2}$  ounce, and mix with 1 $\frac{1}{2}$  pints of rain water and bottle for use. Do not cork up until the acids have all blended or the bottle may burst. Label it poison. Go over the barrels and set them away for 24 hours. Then rub the rust off with a woolen cloth. If the color is not dark enough repeat, let dry 24 hours then card with a scratch brush. Wash off rust and rub with linseed oil to stop further rusting. This brings out the twist and shows it up beautifully. E. C. JOHNSON.

**Comments on the October Issue.**—I notice in the October number that brother S. J. Pemberton desires to get some information about how to shoe a horse that interferes in front. There are various ways, but the most successful that I have tried is to straighten the feet on the inside quarter and

use a shoe as shown in the accompanying engraving. This shoe has a heel on the outside but no heel inside. The inside is beveled on first quarter. When the animal is a confirmed striker, raising the heel with a low or medium heel calk on the outside heel is all right.

Mr. Freemont Kelley's idea of a shoe for contracted feet is old to me, but yet it is new to many of the younger members of the craft. Upon the whole the shoe is very satisfactory where feet are kept in proper condition to admit of spreading, and if the horse's feet are properly cared for, they will keep soft enough so as not to need a shoe of this kind as a hoof spreader. For example: while running a shoeing shop in San Francisco I had a few customers that made a practice of packing the front feet three times (at night) every week, thereby giving the shoe a chance to spread the feet when necessary to do so. For when the feet are soft I fit the shoe wider than the foot and set my nails close to the inside of the nail hole. In this way I can spread a hoof nearly half an inch at one shoeing.

An almost universal fault with many



FOR THE HORSE THAT INTERFERES IN FRONT.

shoers is that they cut down the heel too much. A good frog and a strong heel, with plain shoes on the front feet, so that the frog touches ground, is the only way to keep a horse's feet under him. I always keep an eye on a new floor man to see that he dresses the foot my way. Here in California horse's and mule's feet get so hard in summer that it is next impossible to change them at all.

Brother Ferron's idea on shoeing for interfering behind is O. K. But there are various ways to remedy interfering. How to shoe the knee hitter by A. A. Duba is all right, so also is the cross firing shoe by Bushausen and Martin, in fact all are very good.

GEO. F. WHERRY.

**A Unique Side-Line.**—Answering your request in the November issue regarding side lines, I am bold to state that I have a side line such as you seldom hear of in connection with a well regulated and very busy carriage shop. It is nothing less than drugs, patent medicines, my own make of hand lotion or skin tonic, and filling and compounding prescriptions.

How did I get onto this queer side line—that is, queer as being connected with my regular business? Well about ten years ago I was on a vacation in southern Kentucky to visit a friend, a druggist. I spent a good deal of time in his store—a large one

in a city where they have free mail delivery, and became interested in his business, particularly in the compounding of prescriptions. He noticed my interest, made a suggestion, I grasped it and after studying diligently for six months was examined and given my certificate and afterward went into the regular drug business and busted. I got back into the carriage business and am doing fine with my drug business on the side. Selling on credit while in the drug business gave me such an awful set back that I have not yet sufficiently recovered to allow myself to credit anyone in my carriage business. Selling drugs alone on credit would never break anyone, but there are so many other things to be sold in a drug store that if you let them get away from you without the cash, even the enormous profits will not pull you through.

I have other side lines, a few of which I will mention, as they may prove a "kedge anchor" to some one some day. I sell iron and wood-work to the small shops in the hills and keep a large stock on hand always; shafts, crossbars, rims, spokes, reaches, fifth wheels, bolts, tires, springs, rubber duck, curtains and storm aprons, dashes, axle beds, head blocks, clips, anti-rattlers, and quick shift couplings. I also sell paints—the quick drying and ready mixed, grubbing hoes, sprouting hoes, (my own make) picks and pick handles, axe and hatchet handles. I handle the best grades of all the things I sell and get the price it ought to bring. With all this stuff on hand there is always something doing. By perseverance and strict attention to business any smith ought to be able to fix himself in business. If he has not much capital to start with he generally has good health, and by working steadily, can gradually build up a stock that in a year or two will surprise him. The money put into this stock will bring better interest than ten times that amount in real estate and yet being a practical man, or rather a working mechanic he can always look upon this as only a "side line". RICHARD O'HEARN.

**Several Pointers on Tire Setting.**—In my estimation tire setting is as important a job as any I know of. My work is mostly light work and a smith cannot be too careful with light wheels. My plan is first to examine my wheel and get it in proper shape for the tire. I then take my tire wheel and travel my wheel, get the exact size, then travel the tire and see how much upsetting it needs. I then upset till I think it is about right. Then I travel the tire again and if too hot I cool it off and get tire the same as the wheel. I then heat again and put it on. Don't burn the rim if possible and you will get a good job every time. I tried calipers at first, but found they would not do except on very heavy tires and very often on them it is not safe for the tire will get out of shape and cause the tire to be too tight. I use a graduated tire wheel and can tell to a dot what I am doing and I find it quicker and safer in every respect than calipers or guessing at it, as some of the boys say they do. I admit that guess work is all right when it hits right but how often does that happen in tire setting. Probably once in fifty times, unless the smith is well versed and takes off the tire himself. I always have the helper take off the tires and number them at a joint so they will go back as they came off. I have been following this

rule for at least 15 years and have had good success. Boys, it won't do to guess at tire setting if you want to please your customers and bring more work to your shop. I have a man in mind now who ran a buggy until he wore the rim almost in two. He said if a buggy tire was ever reset the buggy was ruined. But after sometime I persuaded him to let me set them and I gave him a good job, left the same dish in his wheels and he was well pleased, but regretted not having it done sooner. This man was so used to seeing tires guessed at and the wheels ruined, that he was actually afraid to have them set. I have several customers that are very hard to suit and who watch me very closely but I find no trouble in pleasing them for they have watched me until they found it unnecessary for if the job cannot be done satisfactorily I always tell them so and show them where the trouble is. I have one man so precise that he most always plans his work and even prices it before he leaves home. Sometimes his prices are under

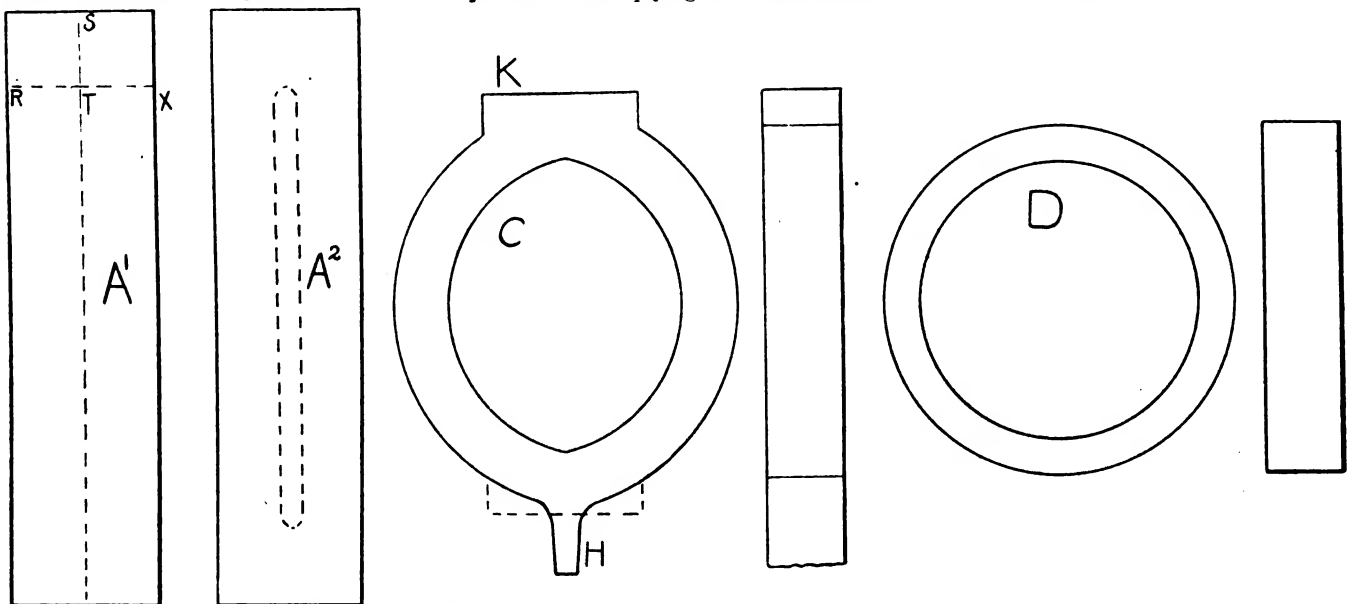
**Solid Collars Split from the Bar.**—Brother John Wymond asks about forging small rings from the solid. For instance, 2 inches in diameter of 3-inch stock by 2 inches wide. He also asks for the best known rule for finding the volume of a piece of material whose area is in fractions of an inch. His second question is how long would a piece of stock 6 inches by 2 inches have to be split, so when opened the ring formed would be 8 inches in diameter.

The first question is fractional area. Multiplication of fractions explains every thing that is required to be known to answer this question. Example: the band to be made is as follows:  $\frac{3}{4}$ -inch stock by 2 inches diameter and 2 inches wide. We first require the area of the cross section of the stock the band would be made of, if forged from the bar. In this case it would be 2 inches by  $\frac{3}{4}$  of an inch. The circumference should be found next by the rule  $3\frac{1}{2}$  which would be in this case 7.464 inches, call it  $7\frac{1}{2}$  inches. Multiplying the circumference

split, so when opened the ring formed would be 8 inches in diameter? Mr. Wymond does not mention the size of the cross section of the ring, so we will take it for granted that the largest cross section is desired that can be made from this size material.

The best results are received, when making solid bands this way, by punching two  $\frac{1}{4}$ -inch holes, one at each end of the split as at A. Now with a thin cutting hack, split the distance between the two holes. The heaviest ring that can be made about 8 inches diameter inside is 13 inches outside, and  $2\frac{1}{2}$  inches thick, as shown at D.

Knowing the size of the ring we next find the volume as previously explained. The ring is 8 inches in diameter and one half of the difference of the outside diameter is  $2\frac{1}{2}$ . Multiplying this by the formula  $3\frac{1}{2}$  we get the circumference.  $8+2\frac{1}{2}=10\frac{1}{2}$  and  $3\frac{1}{2}\times 10\frac{1}{2}=33$  inches. Now multiplying the cross section by the circumference we get the volume of the ring,  $2\frac{1}{2}\times 2=5$  square inches in the cross section. This time the



MAKING SOLID COLLARS SPLIT FROM THE BAR.

mine and then again they are over, so I always divide and go ahead and he praises my work and I praise him. Boys, that is the way to handle a customer hard to satisfy and he will always pay his bill and speak a word in your behalf, which is worth many times more than his work.

In conclusion I will tell W. H. Holliday how to shoe his club footed mule. It may possibly have come from a sprain that caused him to stand on the toe. I would trim the foot properly and nail on a thin steel plate, letting it project at the toe  $\frac{1}{4}$  of an inch. Again in 3 weeks I would give it a little more, curving it up a little so he will not stumble. Repeat this operation, giving a little more each time until the animal can go with a 2-inch toe. Use some good hoof grower to hasten the growth of the hoof. You must exercise judgment and not have the plate or shoe too long at first for it will cause lameness. If you will follow this plan carefully and if the mule is young, I see no reason why his foot cannot be brought straight again. I treated a colt one year old in this way and cured him in about 3 or 4 shoeings. The sooner such things are treated the better and quicker a cure can be accomplished.

W. C. ROBINSON.

by the area of the cross section, we have the volume of the required piece.

Solution by fractions: 2 inches by  $\frac{3}{4}$ -inch by  $7\frac{1}{2}$  equals 2 inches by  $\frac{3}{4}$ -inch by  $7\frac{1}{2}$ -inches. Using cancellation we have  $2\times\frac{3}{4}\times 7\frac{1}{2}=5\frac{1}{2}$  cubic inches. The same results can be had by the use of decimals in the following way: I have found the following method very easy in changing fractions to decimals. To start with one-half (written .5) and divide it by two (2) as follows:  $.5\div 2=.25=\frac{1}{4}$ ;  $.25\div 2=.125=\frac{1}{8}$ ;  $.125\div 2=.0625=\frac{1}{16}$ —and so on. Any one using this plan will in time get so it will not be necessary to write any figures at all, but he can see at a glance the required answer. Solution by decimals:  $2\times.375\times 7.5=5.625$  or  $5\frac{5}{8}$  as  $.125=\frac{1}{8}$ ,  $5\times.125=.625$ .

I think the following rule should fasten in our minds what has already been said in regard to multiplication of fractions. Multiplying the numerator or dividing the denominator multiplies the fraction. For example:  $\frac{3}{4}\times 4=3$  or  $12\div 4=3$ ; or  $\frac{3}{4}\div 4=\frac{3}{16}$ .

Taking our band for example, the area of the cross section is  $\frac{3}{4}$  of an inch of 2 inches or  $\frac{3}{4}$ -inch  $\times$  2 inches =  $\frac{3}{2}$  of a square inch.

Question Two. How long would a piece of stock 6 inches by 2 inches in size have to be

circumference is  $5\times 33$  or 165 cubic inches to make the ring. Divide this by the cross section of the bar stock and we have  $165\div 12$  or 13.75 inches.

Knowing how much of the bar is required to forge the ring let us refer now to the sketch to get the length of the split. A 1 represents the piece of stock cut to the right length with a center line drawn through it. Now mark equal distances from the ends as from T, to R, S and X. When both ends are laid off, punch the holes and cut out the bridge. It can be readily seen now that it is impossible to make the split too long if the volume has been properly figured. No more stock should be left at the ends than any where else. A 2 shows the shape the ends should be before the ring is opened.

There is a small amount of stock lost when punching and cutting out the bridge. In the ring just explained the amount of waste material is only 4.25 cubic inches. I have never known this waste to exceed 10 cubic inches; so at all times I allow 10 cubic inches more than the volume, the amount that is not lost, distribute all over the ring and can hardly be noticed on any band that has a volume of 100 cubic inches or more.

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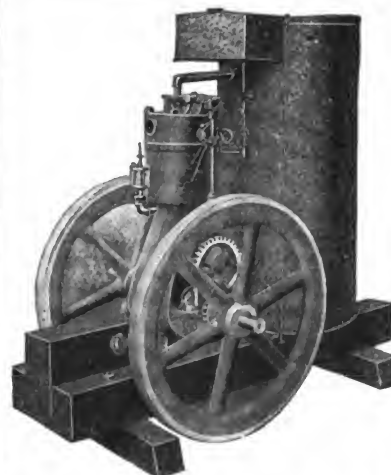
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$\frac{1}{2}$ x 3 in. .... .62	$\frac{3}{8}$ x 6 in. .... 1.81
$\frac{1}{2}$ x 3 in. .... .65	$\frac{1}{2}$ x 4 in. .... 1.70
$\frac{1}{2}$ x 3 in. .... .75	$\frac{1}{2}$ x 6 in. .... 2.10

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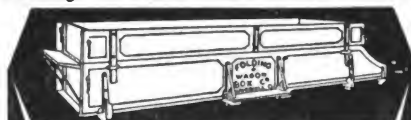
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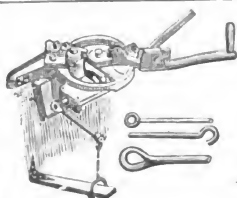
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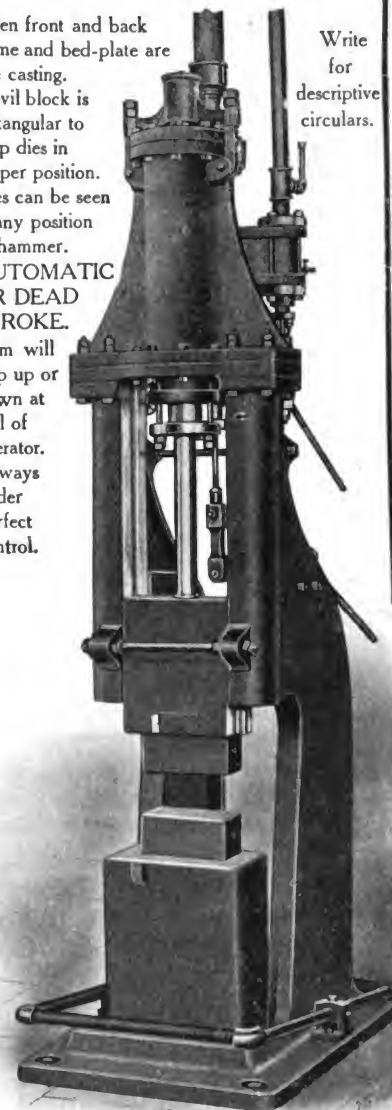
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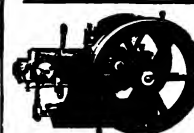
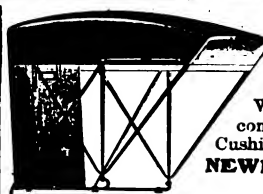
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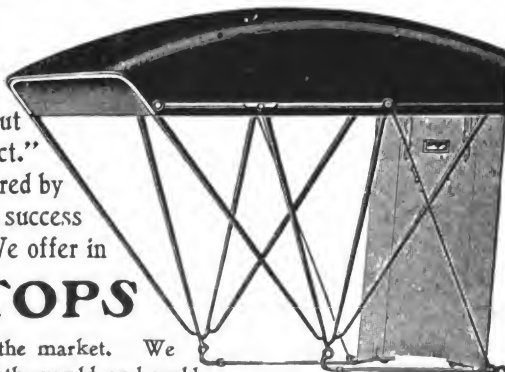
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A most valuable treatise upon forge work of all kinds. It is profusely illustrated and contains chapters on welding, upsetting, drawing out, bending, metallurgy and calculation of stock, also tables and formulas. This is the best book of the year. It has over 250 pages and is bound very neatly in red cloth. Price, \$1.50.

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*By A. Lungwitz*

A very complete work on the anatomy of the horse. Contains chapters on interfering, forging, diseases of the foot, how to shoe diseased and healthy feet, etc. Over 100 illustrations and 170 pages. Handsomely bound in blue and gold. Price, \$2.00.

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A very complete treatise on the painting of vehicles, from a most delicately colored carriage to the rough and ready farm wagon. Recipes, formulas and mixtures. Full directions for every kind of vehicle painting. Fully illustrated and bound in red silk library cloth. Contains over 150 pages. Price, \$1.00.

make butcher knives, hammers, chisels, plowshares, wrenches, etc. Contains over 200 pages and is handsomely bound in half-leather. Price, \$1.00.

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A well illustrated book on general blacksmithing work, shoeing, plow and tire work. Contains chapters on case hardening, babbitting, drilling and welding. Tells how to

ANY OF THESE BOOKS WILL BE SENT UPON RECEIPT OF PRICE, POSTAGE PREPAID

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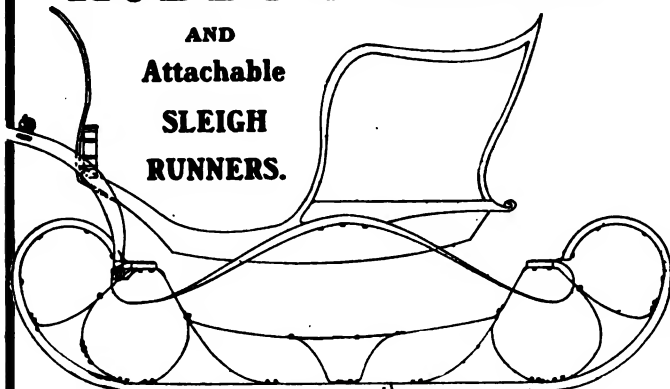
# AMERICAN BLACKSMITH COMPANY

P. O. DRAWER 974.

BUFFALO, N. Y.

## HOBBS'S DOUBLE ENDER SPRING SLEIGH

AND  
Attachable  
SLEIGH  
RUNNERS.



This is the Easiest Riding Sleigh in the world, and the strongest of its weight. On this gear a buggy, surrey or pung body can be hung—combinations that afford great satisfaction.

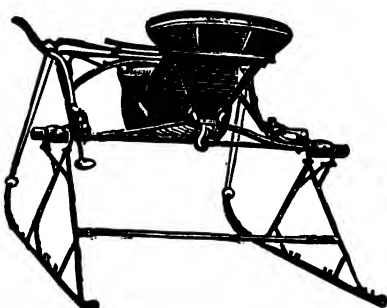
I make the only satisfactory runners to be substituted for the wheels of carriages light or heavy.

Wanted a responsible Blacksmith or Wheelwright in every town where sleighs are used, to take the agency for these goods.

They are covered by seven patents and others applied for. If interested, cut this out and write to

**JOHN E. HOBBS,**

Patentee and Manufacturer,  
North Berwick, Me.



## WESTFAHL (MILWAUKEE) RASPS

Can't be excelled for durability. "Hand Punched."



Our new 18 inch rasp. Round ends.

Ask your dealer for the Westfahl brand. If he can't supply you write us your requirements  
Mention The American Blacksmith,

**WESTFAHL & CO., Milwaukee, Wis.**

## New Books.

OUR CLEARING HOUSE is the title of a most interesting monthly booklet published by Kelly, Mans & Co., of Chicago, Illinois. The pamphlet is written in delightful style, contains many valuable business hints and reflects much credit upon Mr. E. T. Eads, the editor.

A RECENT BOOK by Prof. T. O'Connor Sloane, A. M., E. M., Ph. D., is titled Electricians' Handy Book. The work is a practical reference book on all things electrical. It contains no useless matter, but is concise, compact and directly to the point. It covers its field in a most complete and careful manner, starting with the mathematics of electricity and going step by step to the higher and more advanced branches of the subject. It is written so as to be easily understood and should prove of extreme value to the advanced engineer, as well as to the student. The book is published by the Norman W. Henley Publishing Company of New York City and will be sent post paid either by them or THE AMERICAN BLACKSMITH COMPANY upon receipt of \$3.50.

## Trade Literature and Notes.

IT IS CLAIMED by the Cincinnati Gas, Coke Coal and Mining Company, 315 W. 4th St., Cincinnati Ohio that "Lilly Basin" smithing coal is free from sulphur and the best coal for the shop owner to use. See interesting analysis on page 41.

WELLS BROS. COMPANY of Greenfield, Mass., send us an interesting catalogue of their celebrated taps. The booklet contains a revised list of size, pitch and prices of the Little Giant taps and is very handy for reference in the shop.

AN ATTRACTIVE CALENDAR has been issued by the Revere Rubber Company of Boston, Mass., and in their advertisement on page 25 this firm invites our readers to write for one. We hope that our friends will take advantage of this offer as there is always room for a neat calendar in the shop.

PATENT HAS BEEN GRANTED on the Mayers' Cold Tire Setter, we are advised, by the Henry Mayers Machinery Co., St. Louis, Mo. Since the introduction of this tire setter to our readers, it has become very popular and the manufacturer has received scores of unsolicited testimonial letters.

THE WILEY & RUSSELL MFG. CO., OF GREENFIELD, MASS. recently sent us a valuable catalogue on patent screw cutting and other labor saving machinery and tools. The catalogue is fully illustrated, describes the well known "Lightning" and "Green River" tools and contains interesting price lists. A copy of the book will be sent upon request.

A NOVEL WRENCH sold by Patterson, Gottfried & Hunter, 146-160 Centre St., New York City is illustrated on page 77 of this issue. The 4 in 1 Ellis wrench can be used either as a straight or offset adjustable 8 nut wrench or as a straight or offset adjustable 8 pipe wrench. Write to the above named firm for interesting circulars. Also for catalogue number 39 on blacksmith's tools.

OVER 36,000 APPLE AUTOMATIC SPARKERS are claimed to be in daily use. This popular sparker is shown in the accompanying illustration. In construction it is completely enclosed and said to be dirt, dust, water and oil proof. Interesting descriptive circulars may be had by writing to The Dayton Electrical Mfg. Co., Dayton, Ohio.

AN IMPORTANT FEATURE APPRECIATED by the horseshoer is the reinforced Point of the Northwestern Horse Nails manufactured by the Union Horse Nail Company of Chicago, Ill. Thousands of smiths throughout the country are now using these nails and our readers tell us that they give entire satisfaction. Northwestern Horse Nails are made of the best Swedish iron and in their manufacture every care is taken to obtain the very highest standard of quality.

## 5 h.p. A Popular Size 5 h.p.

"OUT-OF-THE-TOY-CLASS"

No Jobbers, No Salesman, No Agents

## OUR 1906-5 h. p. SPECIAL GASOLINE ENGINES

Will be Sold by Mail Exclusively at the Remarkably Low Price of

**\$162.50**

SENT ON TRIAL.

This Price includes Engine Complete Ready to Run Fully Guaranteed.

Why Pay a Dealer \$40 to \$50

for transacting a little business which you can do as well? Write for Description and Order Blank

WRITE FOR OUR LIBERAL OFFER.

## SPADE ENGINE CO.

Dept. "C," Vicksburg, Mich.

NOTE: See our ad. next month. It will be an Announcement of interest to every progressive shop-owner.

MANY OF OUR READERS are making snug sums by mending broken castings with "Brazil," a brazing compound manufactured by the U. S. Brazing Compound Co. of New Bedford, Mass. There seem to be good profits in this work for the smith and if you have not tried "Brazil" it may pay you to send for a sample working set, which this firm offers to send to any address postpaid upon receipt of one dollar. See advertisement on page 79 of this number.

AT THE LEWIS-CLARK EXPOSITION, a gold medal was awarded The Foss Engine, manufactured by the Foss Gas Engine Company of Springfield, Ohio. The above named firm advise us that their plant is overtaxed to fill their orders and a new addition to their extensive factory is planned. This company has recently issued a very attractive catalogue, fully illustrated and describing the many working parts of their popular engine. A copy will be sent to American Blacksmith readers upon request.

THE LONG LIST of detachable or so called insertable horseshoe calks striving for supremacy has lately been increased by a new comer.

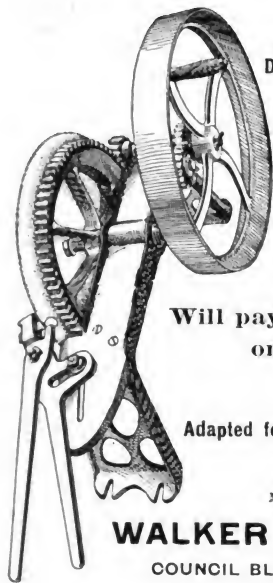
Our readers will notice on Page 8 an illustration of the so called H-Calk manufactured in Germany and used extensively for over twenty-five years all over Europe.

It is claimed that these calks, which strange to say have never been pushed in this market possess advantages which have never been attained by its competitors.

A close examination of the calk will certainly show even the casual observer that the H-Calk is ingeniously constructed, thereby overcoming in a great measure some objectionable features which have always been found to exist in the use of detachable calks.

Besides the usual advantages claimed like the one that the calks remain always sharp, the H-Calks possess the one that they can be easily removed even after being worn down to the shoe, which is due to the peculiar construction of the calk.

We are assured that the calk has been adapted and used a great many years by the various armies of Europe where it was tested alongside of every other device. This fact alone should go a good ways towards influencing our progressive and up-to-date horseshoers to examine into the merits of the H-Calk. Write to the H-Calk Co., 16 Beaver St., New York City for circulars and price list.



No. 1 NOVELTY  
DISC and COULTER  
SHARPENER.

Every  
blacksmith  
should  
have  
one.

Will pay for itself in  
one day.

Adapted for Hand or Power

MADE BY

**WALKER MFG. CO.**  
COUNCIL BLUFFS, IOWA.

## PATENTS PROTECT YOUR IDEAS

No Patent, No Fee. Consultation Free.  
Established 1864.

**MILO B. STEVENS & CO.,**  
852 14th St., Washington.

## PATENTS,

TRADEMARKS and COPYRIGHTS.  
Send your business direct to Washington. Saves  
time and insures better service. PERSONAL AT-  
TENTION GUARANTEED. Twenty-five years  
active practice. SPECIALTY: "Working on  
the Failures of Others".  
**SIGGERS & SIGGERS (Patent Lawyers)** Suite 15, N. U.  
Bldg., WASHINGTON, D. C.

## PATENTS

Send sketch or model for free examination and  
report as to patentability. Patents promptly secured.  
Advice free; terms low; highest references, and best  
service. Address,

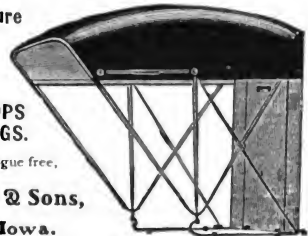
**WATSON E. COLEMAN,**  
Registered Patent Attorney, WASHINGTON, D. C.

We Manufacture  
a Complete  
Line of

**CARRIAGE TOPS  
and TRIMMINGS.**

Illustrated catalogue free.  
Write to-day.

**D. A. Laros & Sons,**  
Grinnell, Iowa.



## The VICTOR SICKLE-DSIC-TOOL GRINDER and DRILL

2,000 to 2,500 rev-  
olutions per min.  
Strongly built,  
has steel bear-  
ings, smooth  
running, dur-  
able and ef-  
ficient.



The above cut shows the device with DRILLING AT-  
TACHMENT. It is the handiest and most useful machine  
for the shop. Drill holes through wood or metal, and can  
be run fast or slow. When this attachment is used the  
grinding wheel, with its high speed, acts as a balance  
wheel and makes the machine steady.



Drilling Attachment

Write for descriptive circular. Manufactured by

**THE MILLER MFG. CO.,**  
SULLIVAN, OHIO.



EACH ONE GUARANTEED.

## BOLT CLIPPERS

**CHAMBERS BROS. CO.,**  
N. Fifty-Second Street,  
Philadelphia, Pa.

It's the  
SPARK  
that  
Counts



Ignite your engine with our  
IMPROVED I. C. C.

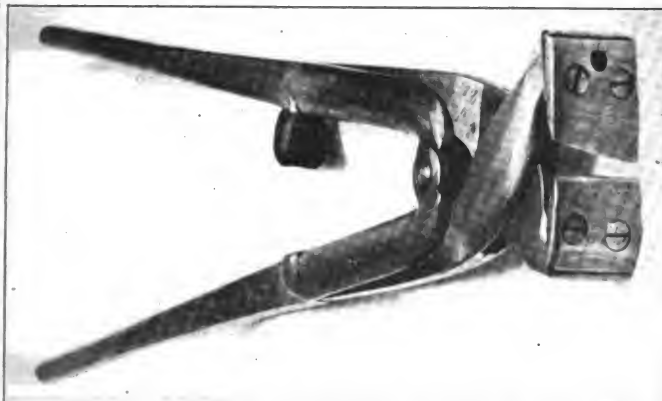
**JUMP SPARK COILS**

We guarantee them against all imperfections in workmanship  
and material. Write us if your engine doesn't work properly.  
**INDUCTION COIL CO.**  
COILS FOR BLACKSMITHS. MILWAUKEE, WIS.

## THE HORSESHOER'S FRIEND

## DeCelle's Hoof-Trimming Nippers

THE BEST TOOL OF ITS KIND ON EARTH. PRICE \$3.00.



The jaws and handles of the Nippers are made of steel castings  
with double leverage in the handles. The knife is made of special  
edge-tool steel and having a shear cut, works with one-half the leverage  
required for the old square-cut tool. Rubber with screw to regulate it.

The knives are adjustable and detachable, and takes only a few  
minutes to detach the knife and grind it. We furnish new knives for  
50c each. You really get a new Nipper for a half-dollar.

Nippers shipped promptly. Price reasonable—\$3.00.

These three valuable methods and DeCelle's Hoof-Trimming Nippers sent for \$5.00. Write for particulars. Circulars free.

**J. D. DE CELLE, - - Ft. Collins, Colo.**

*Special Offer to American  
Blacksmith Readers.*

READ THIS CAREFULLY.

Send \$1.00 for instructions how to make DeCelle's  
celebrated welding preparation. It is un-  
surpassed. The blacksmith's greatest aid. You can mix it in 15 min-  
utes and it will be in shape for a year's use. It's a money maker.

Send \$1.00 for a new invention of greatest value to  
the horseshoer, a new way to put a  
clipping horn on a common anvil. The method is easy and worth  
many times the small price asked. It's just what you need.

Send \$1.00 and receive our method to rig up an at-  
tachment to hold a horseshoe steady  
while drawing a calk sharp. Your brother smiths say it's great.

We send plain instructions and descriptive photograph with  
the above. They all work to perfection.

W

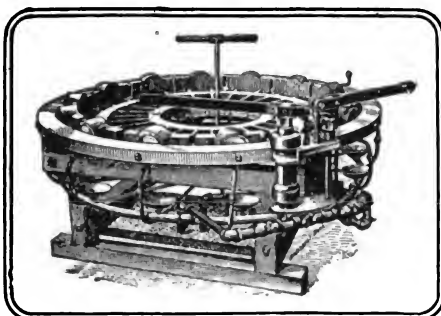
# THE RESULT

W

of thirty year's experience enables us to produce a Tire Setter that is built right, works right and stays right. We refer you to customers who have used a WEST for over ten years. Our machines are used by the better classes of manufacturers and repairers in all corners of the earth.

## THE WEST POWER TIRE SETTER

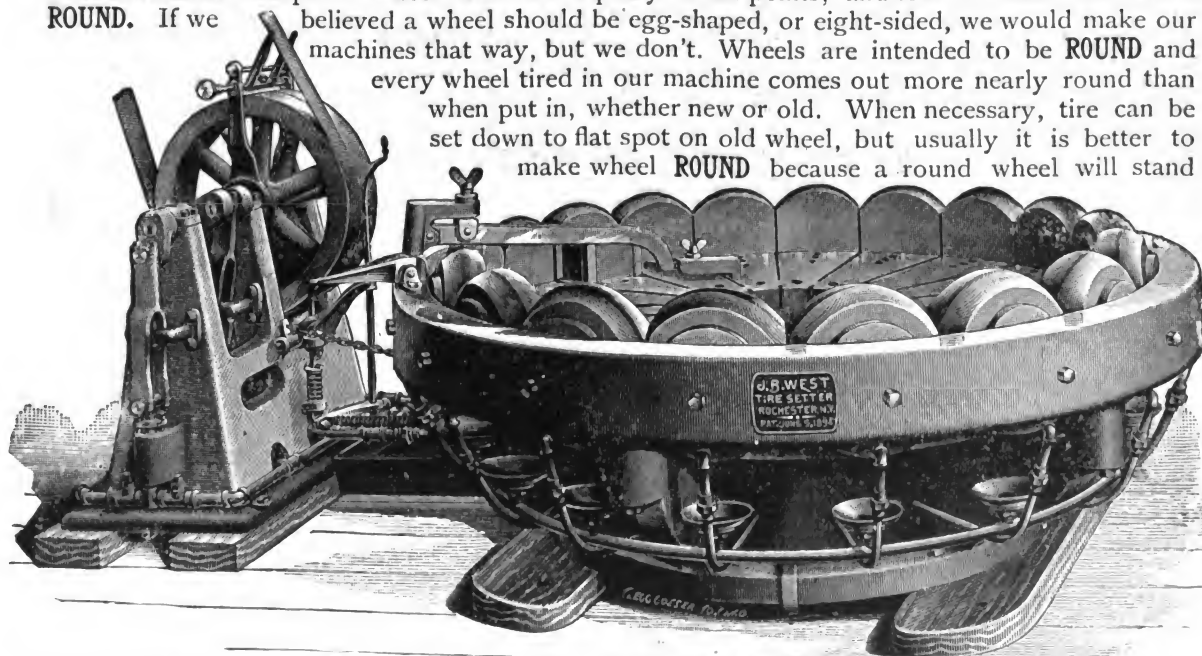
*Is made in various sizes suitable for the handling of tires from 9 inch wide down to  $\frac{3}{4}$  inch. This machine has been adopted by the principal Foreign Governments and is used in twenty foreign countries. Hundreds have been sold in the United States, Canada and Mexico.*



## THE WEST HAND TIRE SETTER

*Is for those who have no power or cannot afford to put in one of our large machines. Not so heavy as the power machine, but embodies many of its principles, and worth many times its cost where there is work for it to do.*

OUR MACHINES compress wheel and tire equally at all points, and tend to make the wheel ROUND. If we believed a wheel should be egg-shaped, or eight-sided, we would make our machines that way, but we don't. Wheels are intended to be ROUND and every wheel tired in our machine comes out more nearly round than when put in, whether new or old. When necessary, tire can be set down to flat spot on old wheel, but usually it is better to make wheel ROUND because a round wheel will stand



longer and harder service. That's why they're made that way. Some have made mistakes in buying Tire Setters. Thought any old machine would do. Next time they will get a "West Hydraulic" and be happy. Give us your order now, and as the loose tires come rattling to your shop, watch your pocket-book get fat—and the satisfied look of your customers.

A "WEST HYDRAULIC" TIRE SETTER is "a joy forever."

Write for Price and Terms.

**The West Tire Setter Co.**  
ROCHESTER, N. Y.

W

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**WHY NOT  
STOP YOUR  
TROUBLES  
?**



**A WIZARD TUBULAR DOES IT.  
30 DAYS FREE TRIAL.**

Armature incased in WATER-PROOF non-corroding brass tube.  
All brass screws. Friction, Belt or Governor drive.  
Brush-holders removed without loosening screws.  
All parts polished brass. Contact and Jump Spark.

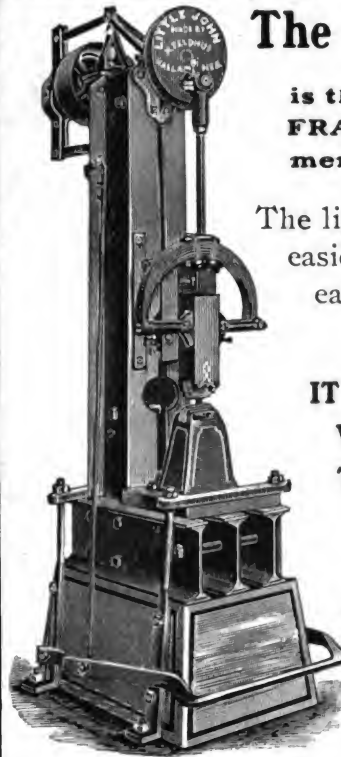
**A TRIAL WILL CONVINCE YOU.**

Most popular and satisfactory Magneto on the market.  
Price as popular as Machine.

**GOVERNOR DOES AWAY WITH BATTERIES AND SWITCHES.**

**HERCULES ELECTRIC & MFG. CO.,  
Indianapolis, Ind.**

Write for Catalogue and SPECIAL OFFER.



## The "Little John"

**is the only STEEL  
FRAME power ham-  
mer on the Market,**

The lightest, most durable,  
easiest controlled and  
easiest running ham-  
mer made.

**IT WILL DO A GREATER  
VARIETY OF WORK  
THAN ANY OTHER  
HAMMER.**

"I have operated four hammers, the  
Minneapolis, Hawkeye, The Little  
John, and yours, and I think that  
yours runs the best of them all."  
ANDREW SCHAUPPNER  
Belden, Nebr.

For description and prices, address

**The Lincoln Mfg. & Development Co.  
LINCOLN, NEBR.**

# WOLFE'S COLD TIRE SETTER

**A MONEY-MAKER FOR THE BLACKSMITH.**

**The Best Machine on the Market for Setting and Re-Setting Tires Cold**

The desirable points in a cold tire setter are strength, endurance, quick adjustments and economy of space. Wolfe's Cold Tire Setter combines these to a remarkable degree. It occupies 2 ft. x 3 ft. floor space. It is made entirely of best open-hearth steel; it is neat in appearance, and will last a life time.

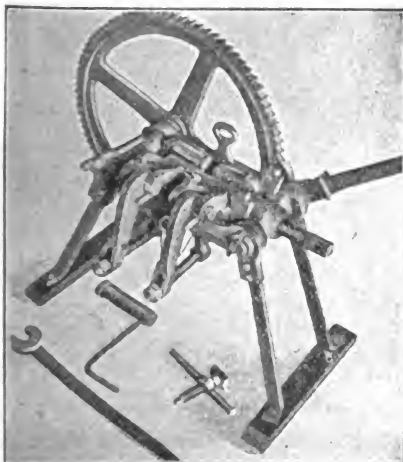
**GIVES SATISFACTION TO EVERY PURCHASER.**

Edward Black, Bendersville, Pa.—"The Wolfe Cold Tire Setter bought of you is the machine to set tires quick and right. Does better work than any other machine I know of, and beats the old way of setting tires, three to one. It is just what every blacksmith needs."

**WE CARRY**

**A COMPLETE LINE**

Of all kinds of VISES, and can make  
special attractive prices to the Black-  
smith. Write for particulars.



## INCREASE YOUR TRADE IN 1906

by buying one of these up-to-date modern machines. It means quick, efficient service to your customers. You can set their tires "while they wait." Saves time, labor and means more trade and more money to the smith.

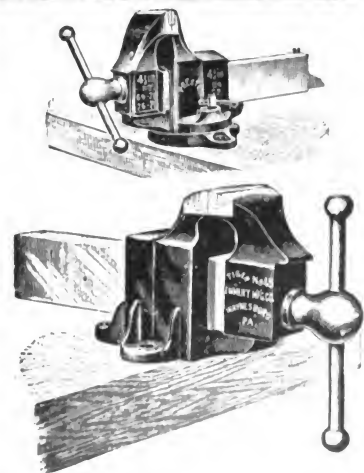
Interesting Descriptive Circulars

**SENT FREE.**

**WRITE TODAY. A Postal will do.**

MANUFACTURED BY

**The G. M. YOST COMPANY  
Waynesboro, Pa.**



# ALL HARD WORKING BLACKSMITHS

SHOULD TAKE ADVANTAGE OF OUR  
LIBERAL 30 DAY FREE TRIAL OFFER

## — LAZIER — GAS AND GASOLINE ENGINES

PORTABLE, ON SKIDS AND STATIONARY.

Shipped on trial direct from our factory without agents. Easy payments to blacksmith customers. Will accept part cash and balance in monthly payments. Get a Lazier Engine immediately. Accept this unusual offer now. The engine will turn out more work and pay for itself in a very short time. Write for particulars.

INSTALL POWER IN YOUR SHOP

YOUR BUSINESS WILL GROW, YOUR PROFITS WILL  
BE INCREASED AND YOUR LABORS WILL  
BE LIGHTENED.

Power is a Necessity in every up-to-date Shop.

LAZIER ENGINES are noted for their high class workmanship, smooth running qualities, ease of operation, durability, simplicity and economy in operation, making them stand out, without question, as the highest type of

### GUARANTEE

They have few working parts, all of which are in plain sight and easy to get at. Our written guarantee covering the quality of material, workmanship, etc., goes with every engine. Warranted to be perfect in every detail. Highest award wherever shown in this country and Europe. We have been devoting our entire attention to the manufacture of gas engines during eight years past, operating a \$400,000.00 plant.

#### MACHINE SHOP.

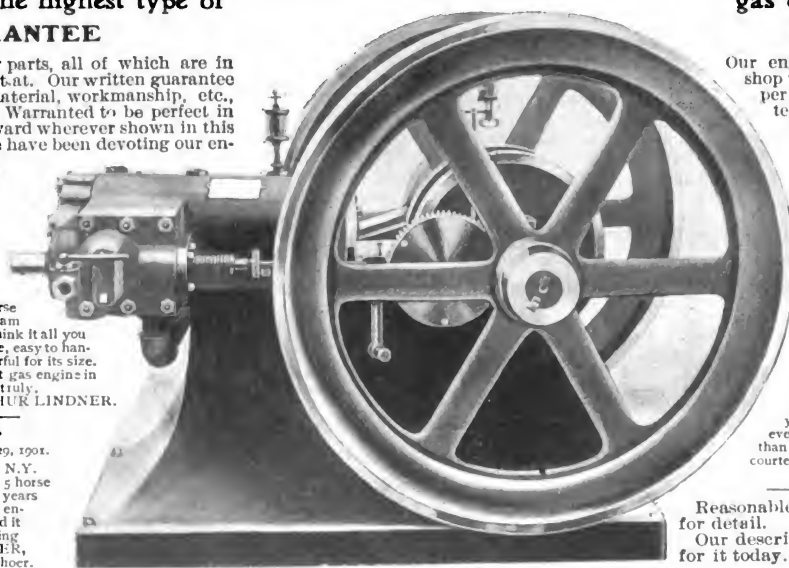
Rochester, N.Y., 8-11-01.

Lazier Gas Engine Co., Buffalo.  
Gentlemen:— I like your 5 horse power gas engine, will say I am more than satisfied with it and think it all you recommend it to be. It is simple, easy to handle, steady speed and very powerful for its size. I would recommend it as the best gas engine in the market.  
Yours very truly,  
ARTHUR LINDNER.

#### BLACKSMITH.

Buffalo, N.Y., March 29, 1901.

Lazier Gas Engine Co., Buffalo, N.Y.  
Gentlemen:— I have used your 5 horse power gas engine for about two years and find it superior to any other engine I have used, and recommend it very highly to anyone that is going to use an engine. J. W. ISHSTER,  
Practical Horseshoer.



2 1-2 TO 100 H.P.

### ECONOMY

Our engines are especially adapted to shop use and operate on three cents per day per horse power, running ten hours per day. We have 500 of our engines being operated in Buffalo alone, all of which are running on this economical basis.

#### CARRIAGE BUILDER.

Buffalo, N.Y., Aug. 6, 01.

Lazier Gas Engine Co., Buffalo.

Gentlemen:— The 2 1-2 horse power engine you furnished me about two years ago more than pleases me. I am running a power drill, grind stone, one rip saw that cuts two inch oak and a fan for blowing two fires, and I have never lacked power or had any trouble with it in any way. I am using illuminating gas at \$1.00 per thousand and the bills have only been \$2.50 per month. I find that you are very modest in your claims, as in every way your engine has turned out better than you said it would. Thanking you for your courteous treatment, I am, Yours very truly,  
FRED SEEHASE.

Reasonable prices and easy terms. Write for detail.  
Our descriptive catalogue is free. Send for it today.

## LAZIER ENGINE COMPANY,

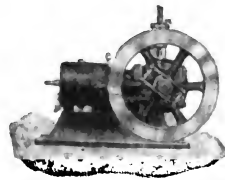
585-587-591 Ellicott Square,

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**NATIONAL BRAZING COMPOUNDS**  
for brazing cast iron, steel and aluminum  
Greatest success of the age. Gold Medal  
awarded at Portland Fair. Eastern agents

**DRISCOLL & FLETCHER,**  
BUFFALO, N. Y.

Send for Circulars. Call and see a demonstration.



The 1906  
**CUSHMAN**

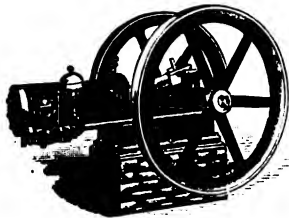
3 H. P. 150 lbs.  
6 H. P. 225 lbs.  
Simple, Durable.  
Free Catalogue.  
**CUSHMAN MOTOR CO.,**  
Lincoln, Neb



ESTABLISHED 1872

**M. L. EDWARDS CO.,**  
SALEM, OHIO.

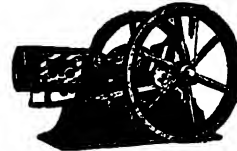
**HAND and POWER DRILLS**  
Hub Boxing Machines, Tuyere Irons etc.  
Catalog Free.



## 4 H. P. ENGINE FOR \$89.00

Every one who receives a copy of the January number of The American Blacksmith is entitled to this special offer. One engine only will be sold to each purchaser. A 4 H. P. Capital gasoline engine in complete running order for \$89.00, cash with order. Weight of engine 650 pounds. Warranted to run a 28 inch saw and cut 20 cords of wood per day or money refunded.

**C. H. A. DISSINGER & BRO.,**  
Manufacturers Capital Gas and Gasoline Engines,  
WRIGHTSVILLE, PA.



The  
**SIMPLEST**  
Engine Built

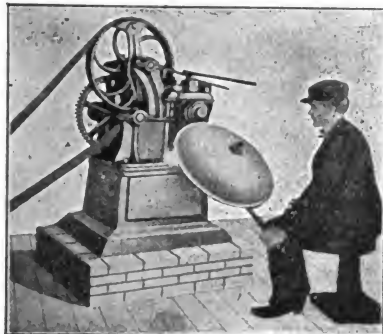
## The DAVIS Engine

Combines all Modern Improve-  
ments. The Safest, most Eco-  
nomical and most Reliable  
Power for the Shop Owner.

Davis Engines are in use every  
day in thirty-four states and terri-  
tories in the United States, in six  
provinces in Canada and British  
America, and in many States in  
Old Mexico.

Drop us a postal card and we will send you  
free a beautiful illustrated catalogue with a full  
description of our Engine. Our prices will in-  
terest you. Write today.

**Cascaden-Vaughan Co.,**  
Waterloo, Iowa, U. S. A.



## SKOW'S ROTARY DISC SHARPENER

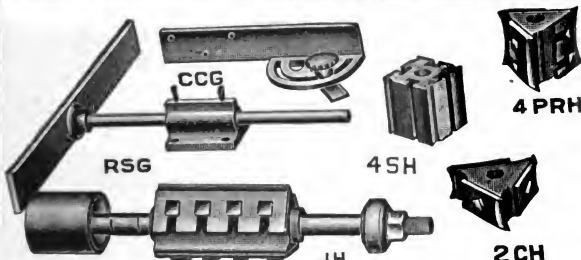
The most practical and economical machine  
on the market. Will roll any size discs.  
Guaranteed to excel all others.  
"You may make my regards for the machine as high as you  
want and I will vouch for them."

W. S. WILSON, Fowler, Kas.  
I have tested your Disc Sharpener thoroughly and find it is  
a money maker for me. I sharpen 16-inch discs in about five  
minutes and it does the best kind of work.

Yours truly,  
ROBERT FISCHER.

Sent on trial to responsible parties.  
Catalogue FREE for the asking.

**SKOW BROS., Newton, Iowa**

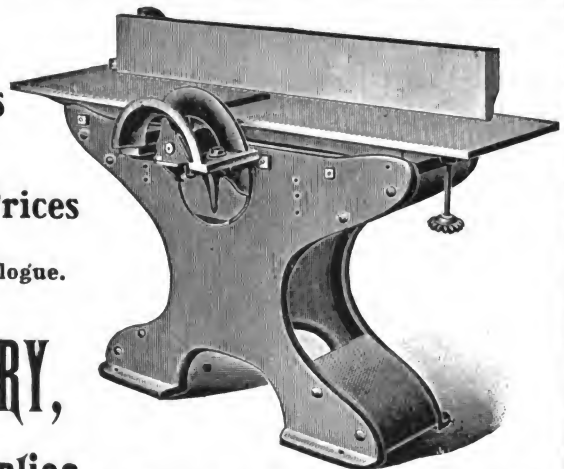


RIP AND CROSS CUT GUAGES, JOINTER AND  
SPECIAL HEADS.

Good  
Tools  
AT

Moderate Prices

Write for Catalogue.



8 INCH JOINTER, SHOWING POLE CORNERING  
ATTACHMENT.

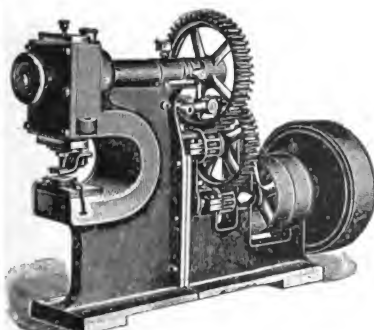
## IRON AND WOOD WORKING MACHINERY,

Factory and Shop Supplies

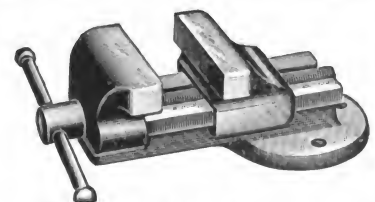
**MECHANIC'S TOOLS**

**The Bicknell**  
**Mfg. & Supply Co.**

**JANESVILLE, WIS.**



**BICKNELL'S NEW PUNCH AND SHEAR.**  
The most up-to-date Machine  
on the Market.



**BICKNELL'S NEW DRILL VISE.**  
5 1/2 Jaw. 5 in. open. Planed bed. Wt. 30  
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The Celebrated "Reece" Screw Plates fitted with the adjustable guide.  
Simplest, Easiest Cutting and Most Durable.

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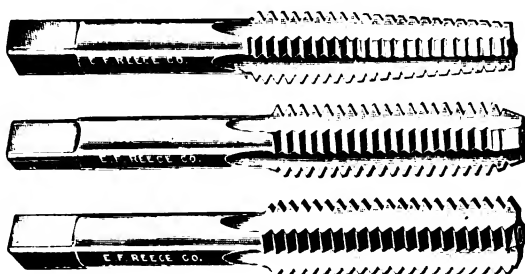
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# THE E. F. REECE COMPANY,

Manufacturers of Screw Cutting Tools, Taps; Dies, Screw Plates, and Etc.

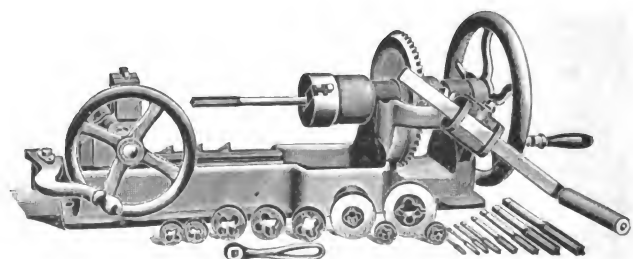
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We Carry a Complete Line of  
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HAND BOLT CUTTER AND NUT TAPPER.



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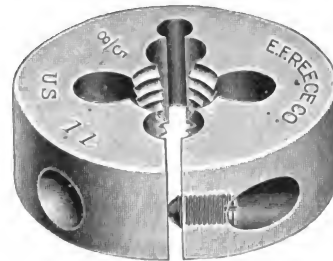
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As True as they can be cut in  
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## Little Giant

**Combined Punch and Shear.**

**The Most Powerful Lever Punch and Shear Made.**

This is not a new machine—only a new cut showing the improvements we have lately added—making it more valuable for the blacksmith. It is made in three sizes. No. 1 will punch  $\frac{3}{8}$  in. hole in  $\frac{1}{2}$  in. iron; cuts iron  $\frac{3}{8}$  in. thick and 1 inch round. Weight, 500 lbs. No. 2 will punch  $\frac{1}{2}$  in. hole in  $\frac{3}{4}$  in. iron, cuts iron  $\frac{1}{2}$  in. thick and  $\frac{3}{4}$  in. round. Weight, 350 lbs. No. 3 will punch  $\frac{1}{2}$  in. hole in  $\frac{3}{4}$  in. iron, cuts iron  $\frac{3}{4}$  in. thick and  $\frac{3}{4}$  in. round. Weight 275 lbs. Each machine is equipped with five sets of punches and dies. This machine is made for the blacksmith shop and we DO claim that it is decidedly the best on the market for that place, and can furnish any amount of testimonials to that effect..



For Sale by your Jobber. If Not, Write Us. Send for Circular.

LITTLE GIANT PUNCH & SHEAR CO., Sparta, Ill.

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CORTLAND, N. Y.

Manufacturers of

**Climax Welding Compound,**  
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 and **BORAX--ETTE.**



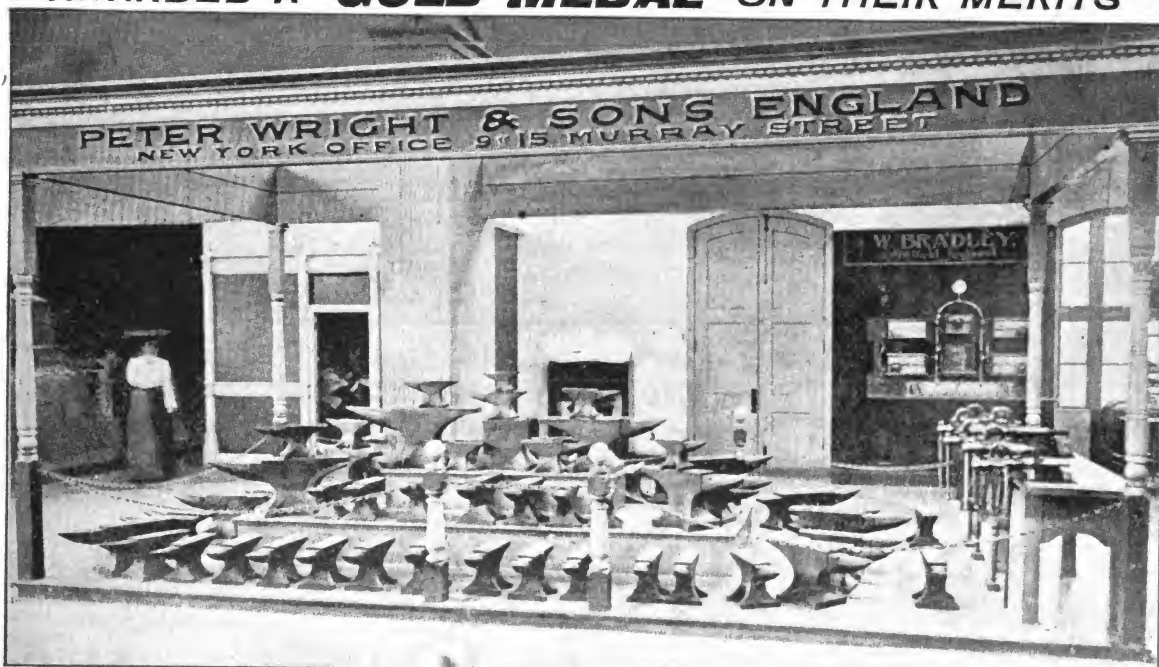
BORAX-ETTE makes steel weld easily. It does not have to be applied between the laps like other compounds, but is used the same as borax. It has no equal for all kinds of steel welding.

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OUR EXHIBIT AT ST. LOUIS, UPON WHICH WAS BESTOWED HIGHEST AWARDS BY THE EXPOSITION JURY  
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By Using **The Wills Automatic Axle Gauge**



THIS IS IT

**IT** works directly from the axis of the axle!  
requires no adjustment.  
conforms to either **straight or taper** spindles.

**YOU** can test the set of an axle by applying gauge to either front or back.  
can obtain the required **swing** by using this gauge.  
can determine the desired amount of **gather** with this gauge.

We can give you all kinds of information about Axle Gauges.

**Large Circular Free.**  
**Our Prices will Interest You.**

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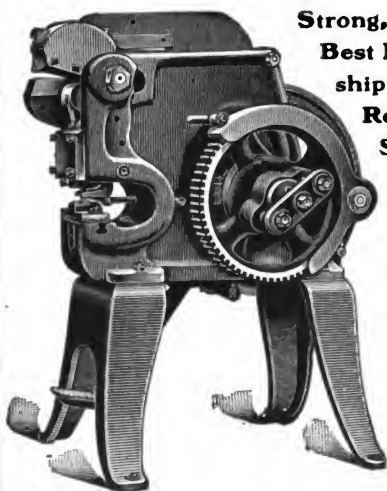


This machine is extremely simple in design, convenient in operation, and suitable for those desiring a reliable piece of apparatus at a low cost.

Frame cast in one piece; adjustable iron table. Tilting rip gauge and adjustable cut-off gauges and many other good features.

Large illustrated circular tells you all about the machine. Write for it. It's free for the asking.

## Combined Power Punch and Shear.



**Strong, Accurate and Reliable,  
Best Material and Workmanship,  
LIGHT RUNNING.  
Requires Little Power.  
Simple, Easy to Handle,  
Won't Get Out of Order.**

Cuts Flat Iron {  $\frac{1}{2}$  x 4 inches.  
                           $\frac{1}{2}$  x 6 band iron  
Cuts Round Iron 1 inch  
Will Punch - {  $\frac{1}{2}$  inch hole in  
                           $\frac{1}{2}$  inch iron  
Will Punch to center of 12 inches  
Size of Tight and Loose Pulleys 12 inches  
Revolutions of Fly-wheels 225  
Floor Space - - - 34 x 42  
Weight - - - - 1400 lbs.

## No. 33 Hand Power Combined Punch and Shear



THE body of this machine is cast in one piece (instead of being two pieces and bolted together) which we claim greatly strengthens the machine. All pins and king bolts are made of steel. The mandrel, which holds the punch, is made square to avoid turning and spoiling the dies when square or irregular shaped punches are being used. Angle shearing attachment can be furnished for this machine when so ordered at extra cost. In punching, the lever works toward the front, and in cutting it works toward the back of the machine.

Will shear  $\frac{1}{2}$  x 2 inch or  $\frac{1}{2}$  x 3 inch flat iron bars.  
Will shear  $\frac{1}{2}$  inch round iron bars.  
Will punch  $\frac{1}{2}$  inch hole through  $\frac{1}{2}$  inch iron plate.  
Will punch to the center of 8 inches.  
Weight 325 pounds.

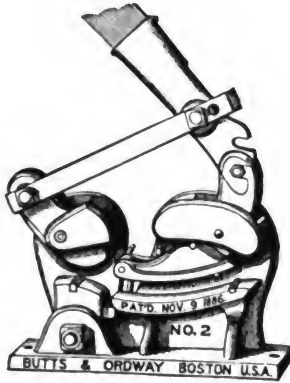
**If you are Figuring on Buying a Power  
PUNCH AND SHEAR  
You had better Write us. We have an  
Interesting Proposition to Offer.**

**BADGER STATE MACHINE CO.**

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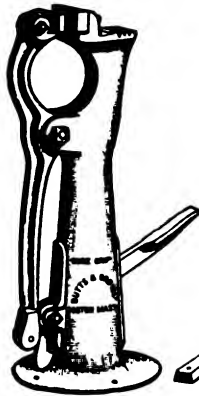
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**B. & O. Sure Grip  
Tire Upsetter.**

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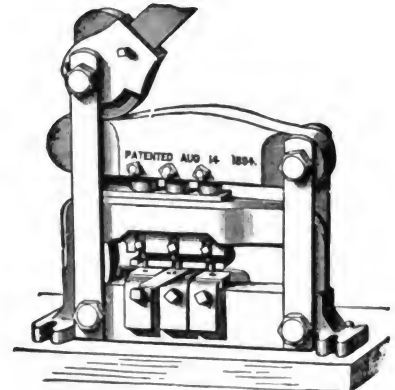
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Iron & Steel****MANUFACTURERS  
— OF —****Blacksmiths' Tools**

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**60 DAYS TRIAL.**  
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**B & O. Sure  
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Adjustable jaw  
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 jaw for sharp and  
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Triple Punch has one each, 1/2, 3/4, and 1 in.  
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**Easy Quad Punch.**

Fitted with any four sizes Punch and Dies.  
 Capacity, 1/2 hole in 1/2 iron and larger hole in  
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 makers' and farriers' supplies from  
 other than the legitimate trade, we  
 wish to advise you that in the  
 future we will not supply such  
 goods to any one not regularly  
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*We stand "Pat" on this Platform.*

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**We Don't Sell  
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**New  
McLean  
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List, \$30.00

Cuts 8 x 1/2, 4 x 1/2, 1/2 Round and Square.

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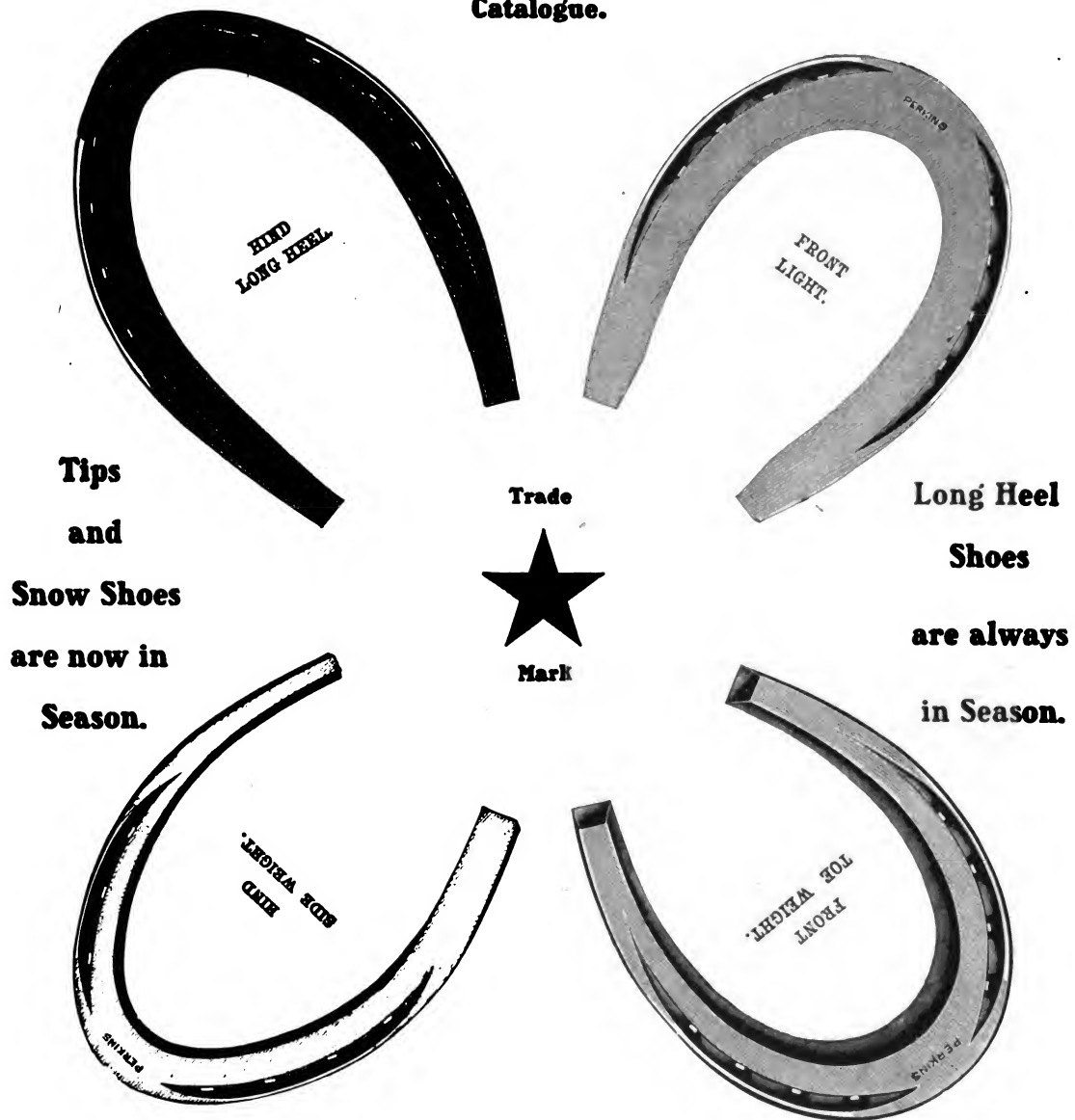
YOUR INQUIRIES SOLICITED.



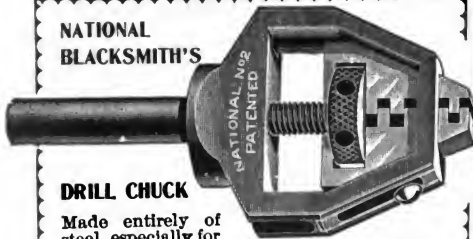
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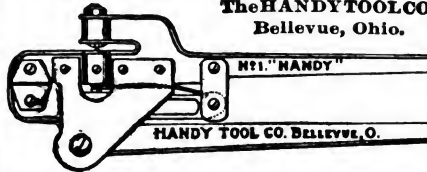
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Note its construction, sturdy and serviceable.

Blacksmiths, wagon and buggy repairers especially, will see at a glance the merits of this axle cutter and appreciate its usefulness.

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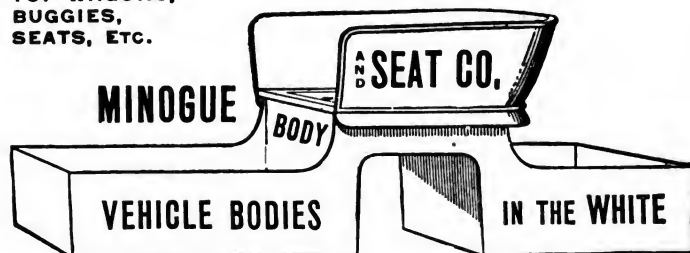
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**"BRIGHTON" HORSE NAILS**

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**STANDARD HORSE NAIL CO., New Brighton, Pa.****Your Hack Saw Troubles**

will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



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Guaranteed to be stronger and more rigid than solid steel axles. We make both. Write us

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A GOOD  
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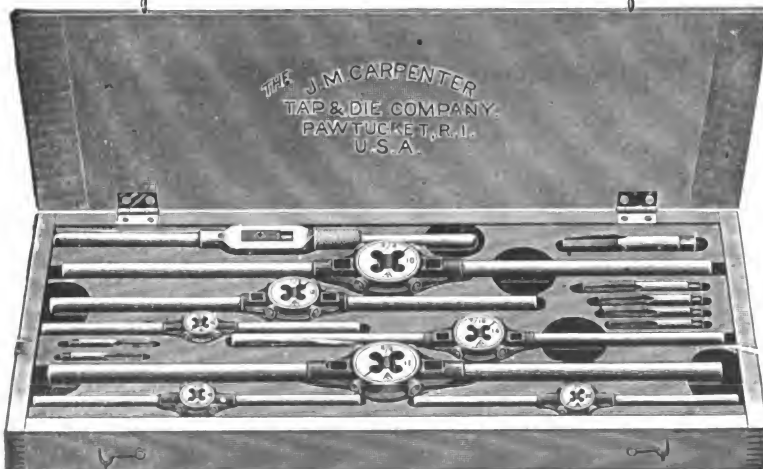
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FULL MOUNTED DIE SETS**

With a stock for each die and the Original Nichols Tap Wrench.

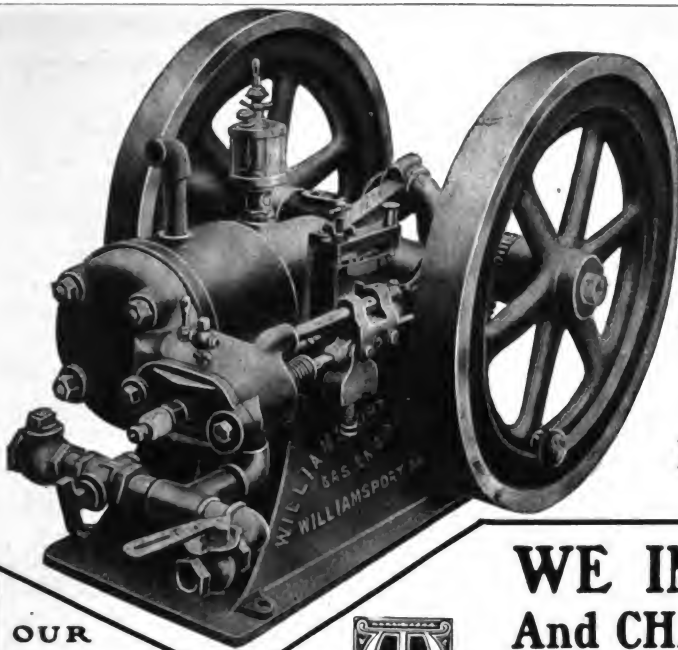
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EVERY BLACKSMITH WILL APPRECIATE THE VALUE OF THIS  
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The dense clouds of smoke which pour into the smithy from the ordinary forge when starting up are entirely done away with in this machine. Fitted with a Buffalo No. 200 Blower—No smoke, gas or soot.

WHEN THE BLAST IS ON and the fire throwing off the densest smoke, the down draft action is at its height, the fan drawing every vestige of smoke, sparks, etc., into the hood at base of stack whence the greater part escapes up the chimney. The remaining portion of waste gases is drawn through a back connection to fan and having received a supply of fresh air through a suitable opening, is returned to tuyere through blast pipe.

Write for full information, prices, etc.

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Buffalo No. 666 Portable Down Draft Forge, with heavy steel plate hearth. Also made with cast iron hearth.

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Complete  
Catalogue  
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Blacksmith's  
Tools.

(A Lady can hold him.)

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FOUR BITS IN ONE

Cures Kickers, Shyers, Bolt-ers, Pullers and Runaways.

There are four distinct ways of using it. They sell at sight. Agents make big money selling them. One agent writes: "I am leaving the farm to devote my entire time to the sale of the bit." Send postal for terms to agents.

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A great many Blacksmiths are selling the bits just by showing them to their regular customers at their shops.

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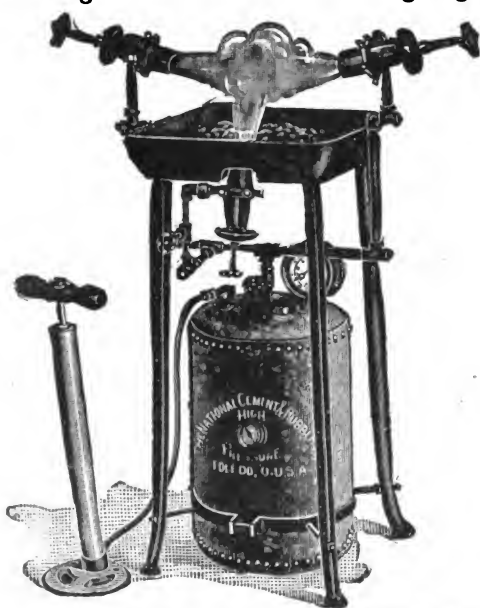
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**"High Pressure" Brand No. 2 Brazing Forge**

Patented February 7, 1900. The up-to-date machine for brazing agricultural implements, automobiles, bicycles, etc. Will do all kinds of brazing, both light and heavy. It is fitted with three powerful Improved Hydro Carbon Burners. Both Gasoline and Kerosene Machines in stock. Write for description.

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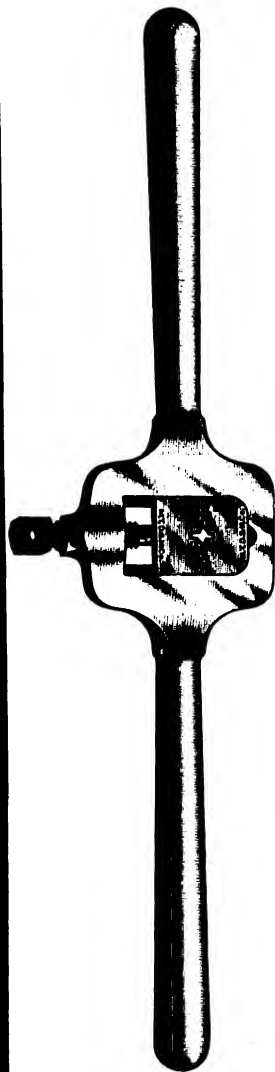
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See that Each Tool  
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WE make and carry in stock various styles of Arbors, Reamers, Chucks, Counterbores, Countersinks, Dies, Three and Four Groove Drills, Drills with Oil Holes, Jobbers' Drills, Letter Drills, Wire Drills. Gauges, Mandrels, Metal Slitting Saws, Cutters with Solid and Inserted Teeth—Axial, Radial, Angular, Form and Gang Cutters; a full line of Taps, Adjustable Tap Wrenches, Opticians', Model Makers' and Machinists' Screw Plates and Dies, Solid Pipe Dies and Solid Machine or Bolt Dies, Tools for Turret Head Machines, and many others; being made as are all of our tools, of the best material and by the best workmen, their accuracy and effectiveness are assured.



SCREW

PLATES

A, B, C AND D.

**Hand Taps.**

Shank size of bottom of thread.



Shank full size of thread.

**Screw Plates.**

Our Patent Screw Plates are of an improved pattern and finish. They are light and durable, and are so perfected as to admit of a change of Die most quickly. The Dies and Plates are carefully finished to standard gauges, and are warranted as to accuracy of size. The Dies are interchangeable. Under or over size Bolts are always properly cut with standard size Dies.

**Hemphill's New Shoeing Stocks  
HAVE COME TO STAY.**

**THE STRONGEST!** Why? Because the weight of the horse is supported by a post and sill which we guarantee is not in the way.

No cogs, springs or dangerous cranks. It can be used in any kind of a building.

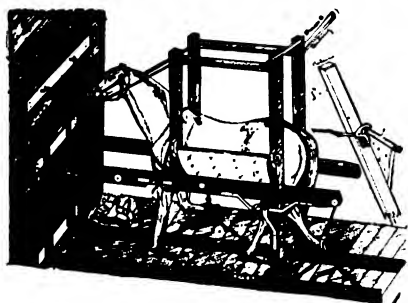
We do not use a rigid, leg breaking vise to hold the foot.

We brace to the ceiling, others to the floor.

Quick and easy to operate and easy on the horse.

Our shoulder rope secures the horse instantly so he cannot get away.

We do not lose from 5 to 20 minutes to get a foot. We get it on the spot and put it in just the right position for the shoer. The horse cannot hurt his leg with our fastening. We use a spreading bar to keep the frames from squeezing the horse. The horse is released instantly. You simply pull a lever and the sling drops from under him. No others have these improvements. In 16 years we have never had a horse hurt in our stocks nor a man injured in handling the feet. We ship on approval and guarantee satisfaction. Terms and prices liberal.

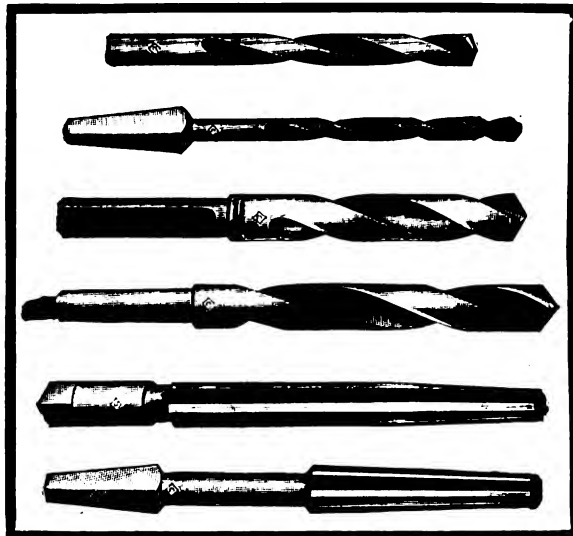
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A Suggestion—For a starter—Ask for GENERAL CATALOG  
1905—then order a few sample tools—put them to work  
alongside the best you have been using—after that why,  
we'll be friends. ARE YOU WILLING TO MEET US  
HALF WAY?

## The Cleveland Twist Drill Co.

OFFICE AND FACTORY, CLEVELAND, O., U. S. A.

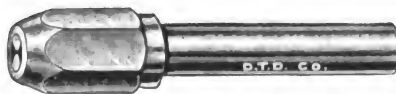
NEW YORK STORE, 62 READE ST.

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### WHY NOT BUY A CHUCK

That will fit the spindle of your drill press, holding drills  
1/2 to 1 in. inclusive, with reducer to 3/4. Drills held by this  
chuck are much cheaper than drills with 1/2 in. or 3/4 in.  
anank. Simplest and cheapest chuck on the market.

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228 21st Street, Detroit, Mich.

### "TOOLS THAT WEAR." HELLER'S CELEBRATED AMERICAN HORSE RASPS, FILES AND FARRIER'S TOOLS.

will save you Time and Money. Their Superior Quality sets a known and tested  
Standard of Excellence. All made from our own Production of Special Refined  
Clay Crucible Steel and Tempered by a Secret Process.



20-IN. ADJUSTABLE JOINTED HORSE TOOTH RASP.

New Catalogue Mailed Free  
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No wick to trim, no smoke, trouble or danger.

*Descriptive matter for the asking.*

Most desirable for Blacksmith's use. Strong, white light. Has improved burner. Strongest wind cannot quench.

*Write for prices, etc.*

### Berger's Improved Gasoline Out-Door Torch.

Capacity, 1 gal. gasoline—Burns eight hours.

**THE BERGER MFG. CO. CANTON OHIO.**

A COMPLETE LINE OF

## Carriage Tops

and Trimmings

Seventeen different grades of tops  
All good ones.  
Prices right.

Ask for No. 5 Catalogue

**C. A. HALLIDAY, 24 Cedar St. Oneida, N. Y.**

## The MARVEL

### Combined Punch and Shear.




Double lever system makes heavy work easy. Cuts and punches iron flat, round and angle. It will pay you to investigate our machine. Write for full particulars, price.

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## BE A RAILROAD MAN

**Firemen and Brakemen Earn \$60 to \$125 a Month**

We teach you by mail and assist you to a paying position when you are qualified. Instruction is practical, thorough, pleasant; fits you for immediate employment and for rapid promotion. Founders and instructors are all prominent railroad officials. School is endorsed by the managers of leading roads who are calling for more men—hundreds of positions waiting for our graduates. Begin now—fit yourself for a steady job at big wages. The railroads need you. Write for free catalogue, THE WENTWORTH RAILWAY CORRESPONDENCE SCHOOL, DEPT. 60, FREEPORT, N. L.



ALL OVER THE WORLD!

# The 1902 CHICAGO CLIPPER

Price, \$10.75

"Stewart's Patent" is recognized as the Greatest Clipping Machine ever invented.

More of them are sold every day ten times over than all other makes combined. Each one is sold under a positive guarantee to clip faster and turn easier than any other machine made, regardless of price, or money refunded. All gearing is cut from solid metal, and unlike any other machine made, it can be turned with either the right or left hand.

## IT'S EASY MONEY

blacksmiths make using this clipper. Horse clipping is now a part of every up-to-date horse shoeing establishment. Why, look at the profit. You can clip a horse in 30 minutes with this machine, and every horse owner recognizes the advantages of clipping.

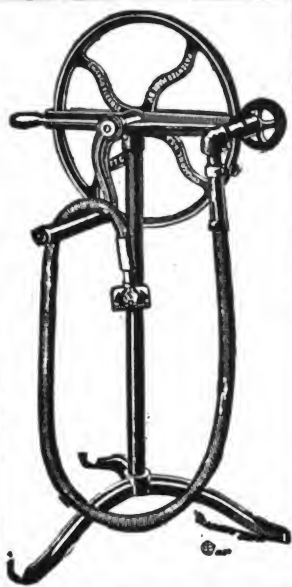
Send \$3.00 and machine will be sent C. O. D. for the balance.

Catalog on request.

Yours very truly,

## Chicago Flexible Shaft Co.

186 Ontario Street, CHICAGO.



# A GUARANTEED HOOF CURE

## Mr. Blacksmith

Would you be interested in learning how to pick up a good many extra dollars in your business with very little extra work? Would you like to increase your business—make it bigger—make more money and make more satisfied customers? You can do it and do it easily with

## O. K. Hoof Remedy

Hundreds of blacksmiths are doing it today and so can you. We want you to sell and recommend O. K. Hoof Remedy to your trade, and this is how we suggest you do it: First, we want you to test it. We want you to KNOW from actual experience what it will do so that you will have confidence in it—so that you will be enthusiastic over its merit. We will stand the risk if it does not do what we claim for it. For example, we offer \$100.00 for any case of Contracted Feet, Corns, Dry, Cracked, Brittle Hoofs, Scratches, Sores, Thrush and Quarter Cracks it fails to cure except in funder when used as directed. We do more—we say to you, and you can say to your customers, back goes your money if it fails. You take no risk. Send for a trial can and get our special liberal terms to blacksmiths. We want you to handle this remedy in your locality. You can sell lots of it and make money. Send today and "clinch" the agency.

THE O. K. STOCK FOOD CO.  
Room 450 Monon Building  
CHICAGO

O.K. HOOF REMEDY  
KEEPS HOOFS O.K.

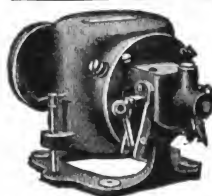


SHEPARD LATHE CO., 132 W. 2d St., Cincinnati, O.

## Lathes and Drill Presses

Especially for Blacksmiths and Machinists, also Hand and Power Planers and Shapers and Machinists' Supplies.

Catalogue M.



## Igniter Dynamos

For all Classes of GAS ENGINES for make and break or jump spark systems. Our latest type price \$15. Write for circular of magnetos, etc.  
THE CARLISLE & FINCH CO.  
243 E. Clifton Ave.  
Cincinnati, O.

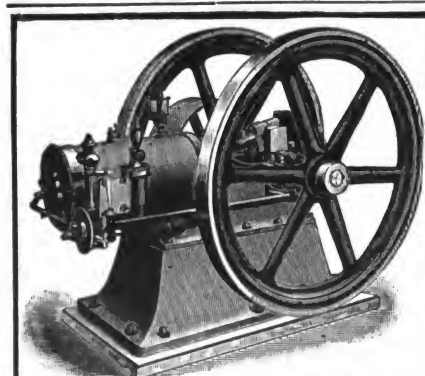


We Manufacture

## SHEARS AND PUNCHES

Hand or power, for shearing and punching plates, bars and angles. Send for Catalogue C.

BERTSCH & CO.  
Cambridge City, Ind.



HIGHEST AWARD--GOLD MEDAL

ST. LOUIS EXPOSITION

FOR

Efficiency  
Durability  
Simplicity

Write for Catalogue and Prices.

BAY STATE GAS ENGINE CO.,

48 Washington St., North,

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## GET A HIGH GRADE ENGINE CHEAP!

In order to clean out our entire engine stock to make room for the winter rush in another line, we offer the following new

Bay State Gasoline Engines  
at GIVE-AWAY PRICES:

- 5 8-h. p. 4-Cycle Engines,
- 2 4-h. p. 4-Cycle Engines,
- 2 7-h. p. 2-Cycle Engines,
- 1 4-h. p. 2-Cycle Engine,
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Write for prices while they last.

BAY STATE MACHINE CO.

1302 Peach Street, Erie Pa.

## HAVE YOU TRIED

## LAFFITTE WELDING ? PLATES !

If not, send for a sample. They make difficult welds easy. Easy welds economical. Welding steel and iron at a low heat, saving one-third in time and fuel.

SEND \$1.00 for three heavy and three light plates as a trial order. All charges prepaid.

FOR SALE BY ALL DEALERS.

F. R. PHILLIPS & SONS CO.,

Penna. Building, Philadelphia, Pa.



# A NEW YEAR'S GREETING

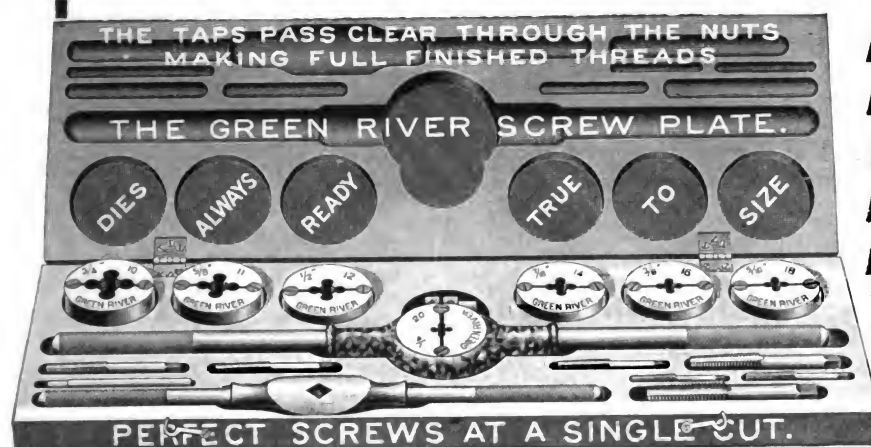
## —Our— *New Catalogue No. 33*

**Free** to all Blacksmiths and Carriage Makers.

Send a Postal Card and have one in your shop.

IT FULLY  
DESCRIBES  
THE

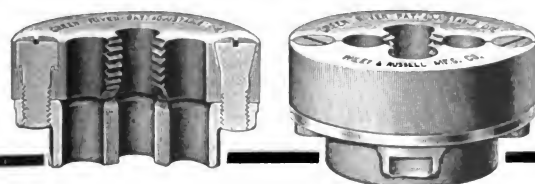
### GREEN RIVER SCREW PLATES



The quality of the Green River Screw Plate, both as to material and workmanship, is up to the highest standard: and its simplicity and durability, with its moderate price, make it particularly attractive. Like the Lightning Plates, it does its work at a single cut. The die is adjustable for wear, and to make bolts and nuts fit tightly or loosely as may be desired.

**WILEY & RUSSELL  
MFG. CO.**

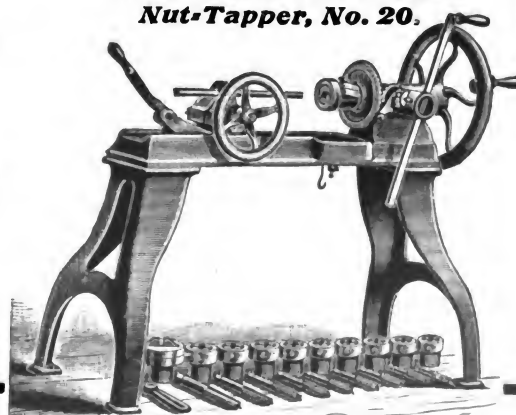
**Greenfield, Mass., U. S. A.**



**Bolt Cutters,  
Horse Shoer's  
Vises,  
Punches, Drill-  
ing Machines,  
Tire Benders &  
Upsetters.**

**LIGHTNING  
TAPS AND REAMERS.**

**Green River  
Hand Bolt-Cutter and  
Nut-Tapper, No. 20.**



# AN HONEST JURY

OF BLACKSMITHS, GIVING OUR GAS AND GASOLENE ENGINES

## A FAIR TRIAL

COULD COME TO BUT ONE CONCLUSION.

WE ARE CONFIDENT THAT

## THE VERDICT

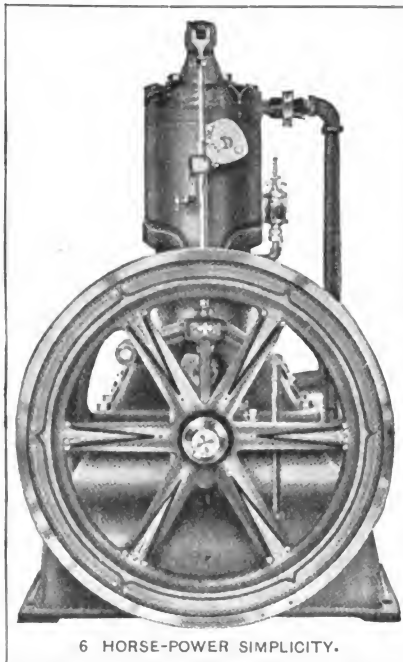
WOULD BE IN FAVOR OF THE

# SIMPLICITY

WITHOUT A DOUBT  
THE BEST ON THE MARKET TODAY

Just what its  
Name Signifies;  
Simplest  
In Design,  
In Construction,  
In Operation.

We do not Hesitate to Guarantee them for we make every part, and know just what is in each Engine, both Material and Workmanship being of the First Order.



6 HORSE-POWER SIMPLICITY.

Blacksmiths find Our Engines especially adapted to their uses. They require very little attention and never get out of order. Satisfaction Guaranteed.

We will send you an Engine on trial and if it don't fill every requirement, ship it back at our Expense. Send for Catalogue.

WE MANUFACTURE ALL SIZES OF ENGINES FROM 1½ TO 15 H. P. WE ALSO MAKE PORTABLES, PUMPING OUTFITS AND SAWING RIGS.

Let Us Send You Our Proposition.

**Western Malleable & Grey Iron  
Manufacturing Co.**

8 - 20 Chase St.

MILWAUKEE, WIS.

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## Potters Spring Brake Blocks

For Vehicles of all kinds with STEEL OR RUBBER TIRE.  
Have a record of excellency for seventeen years. 

**The MORGAN POTTER CO.**

SOLE MANUFACTURERS.

CATALOGUES.

FISKHILL ON HUDSON, N. Y.

## GEAR EXCELLENCE!

The  
Best  
Design  
Material  
Workmanship



O. M.  
Milk Wagon  
Gear  
No. 251

We will exhibit both in New York and Philadelphia, and as in other years we will lead.

Our New Gear Catalogue is now ready for distribution and will be sent FREE to any one.

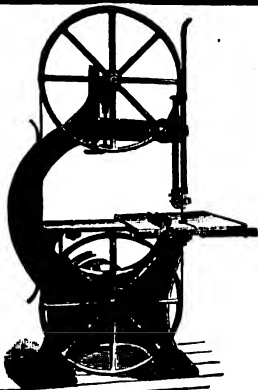
**SEND YOUR NAME TODAY!**

**SCHUBERT BROS. GEAR CO., ONEIDA, N. Y.**

## WAGON SPRINGS.



**D. F. TANNER,  
HOLLAND, N. Y.**



## You Need Wood Working Machinery.

Wood Working Machines in your Shop will enable you to do better work and more of it than you can do with hand tools.

We Build Just the Machines You Need.

Catalog describing a fine line of moderate priced **BAND SAWS, SAW TABLES** and **JOINTERS** mailed for the asking.

Send for it now.

**The Crescent Machine Co.,  
LEETONIA, OHIO.**

245 Main St.

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FOR  
Circularizing and Follow Up Systems

Look like the original and bring results. Furnished complete with names filled in or ribbons to match.

**LERNER - BEAN CO.,  
363 Washington St., BUFFALO, N. Y.**

# Keystone Wagon Works

Nos. 500-518 North Third Street,

**Reading, Pa.**

Manufacturers of

**BUGGIES, RUNABOUTS, CARRIAGES**

AND

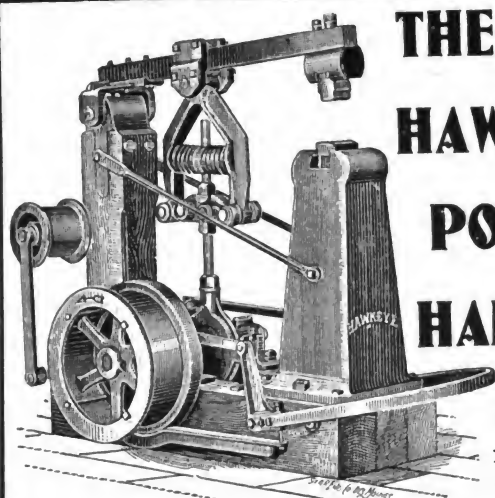
**Wagons in the White**

**Latest Styles**

**Best Prices**

**Write for Catalogue.**

Mention this Journal



## THE HAWKEYE POWER HAMMER

THE HAWKEYE POWER HAMMER NO. 3  
Patented Sept. 29, 1903.

is built  
right and  
runs right.  
Does more  
work and

better work with less repairs than any other power hammer built. If you want a power hammer that is the best now and always will be, ask us about the Hawkeye. They are built in two sizes and sold by the best jobbers everywhere.

For prices and description address

**Hawkeye Manufacturing Co.**  
TAMA, IOWA.

## SEARS IMPROVED PUNCH AND SHEARS

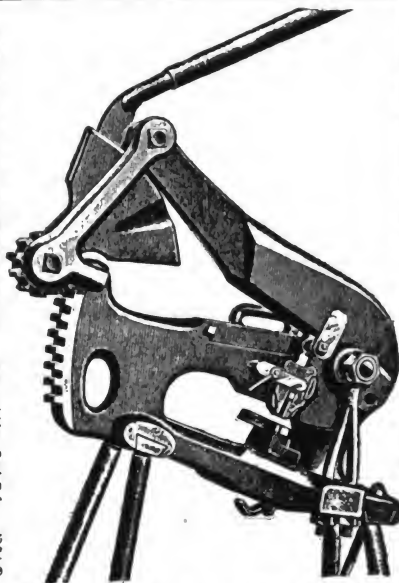
WE herewith present to the readers of THE AMERICAN BLACKSMITH our improved Punch and Shears, a machine that we guarantee to be the **most powerful** and **handy** of any punch and shear on earth for jobbing and wagon shops. This machine has no equal, as it has a power of 38 tons on punch with a man weighing 150 pounds on a 4-foot lever. It will punch a  $\frac{3}{8}$  hole in  $\frac{3}{4}$  iron, will shear iron  $\frac{3}{4}$  by 4 inches wide, and will cut off 1 inch round iron. The above work is done with ease.

### OUR GUARANTEE

We guarantee our Punch and Shears to do the work as stated above, and will give \$200.00 to anyone who will show a Punch and Shear that will compete with ours in a jobbing or wagon shop.

We are the only firm that advertises the length of lever it requires to do the work of these machines, and would suggest before buying a Punch and Shears to find out the length of lever it requires to do the work advertised.

SEND FOR CIRCULARS AND PRICE LIST



**GEO. SEARS & SON**  
ONSLOW, IOWA

## HAND FORGED BUTCHER KNIVES



Ground, Tempered, and all ready for the handles, either round or riveted, for 15 cents each or \$1.50 a dozen. All sizes from 5-inch to 8-inch. These blades are made from Sanderson Steel and warranted. Will replace any imperfect knife with two new ones. Handles all ready to put on, one cent each.

Hand Forged Razors, ready to use, 40c. each; Pocket Knife Handles, in great variety, 10c. Try a sample.

### A Good Side Line

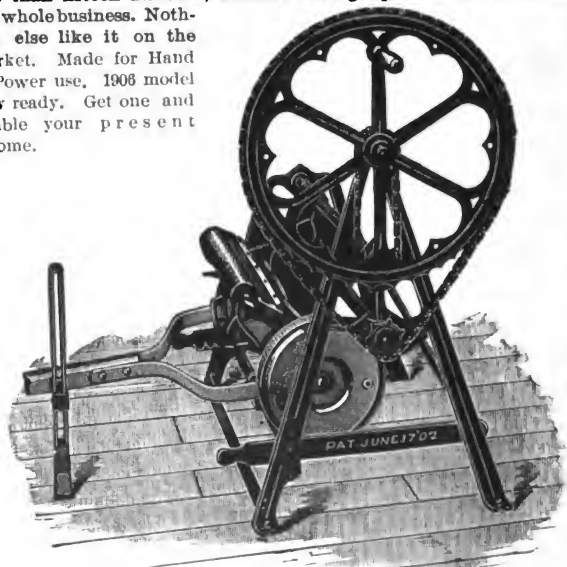
Hundreds of Smiths are Using these Blades and Make Money and friends selling them. Liberal Discount in Quantities.

ADDRESS:

**Woodworth Knife Works**  
NUNDA, N. Y. Established in 1876.

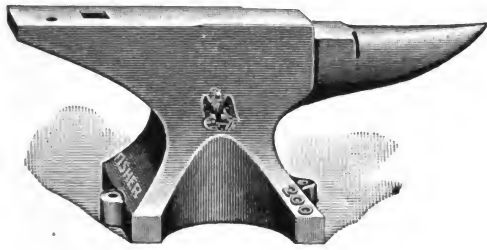
## The "Ideal" Lawn Mower Grinder

Will enable you to grind any lawn mower with absolute accuracy in less than fifteen minutes, without taking apart. Revolutionizes the whole business. Nothing else like it on the market. Made for Hand or Power use, 1906 model now ready. Get one and double your present income.



For full particulars, prices, etc., address the manufacturers,  
**THE ROOT BROS. CO. PLYMOUTH, OHIO**



**"EAGLE"****ANVILS.**

1843

1905

**We have had over sixty years of Experience in this line and offer you the most reliable Anvils on the Market. Every one Guaranteed.**

The Face Consists of a Single Piece of the Very Best Cast Steel Perfectly Welded and of the Hardest Temper. The Horn is made of Tough Untempered Steel and will neither Break nor Bend.

All "Eagle" Anvils made with the Latest Fisher Patent Double Thick Steel on Both Edges of the Face. Made in all Shapes and Sizes up to 1300 lbs. Weight.

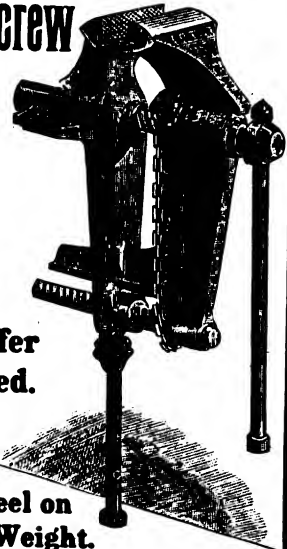
WRITE FOR INTERESTING CIRCULARS AND PRICE LIST. SENT FREE.

**EAGLE ANVIL WORKS,****TRENTON,  
NEW JERSEY.****PIONEERS**

In the Manufacture of

**ANVILS AND VISES OF QUALITY****"Fisher" Double Screw  
Parallel Leg Vise**

Is sold by Reliable Dealers Everywhere. For Strength and Durability there are none better made. The "FISHER" is acknowledged the best for Blacksmiths

**ROBERTSON'S**

TRADE

**AUTOMATIC STRAIGHT LINE****GAS AND GASOLINE  
ENGINES**

See that Cross Head and slide making

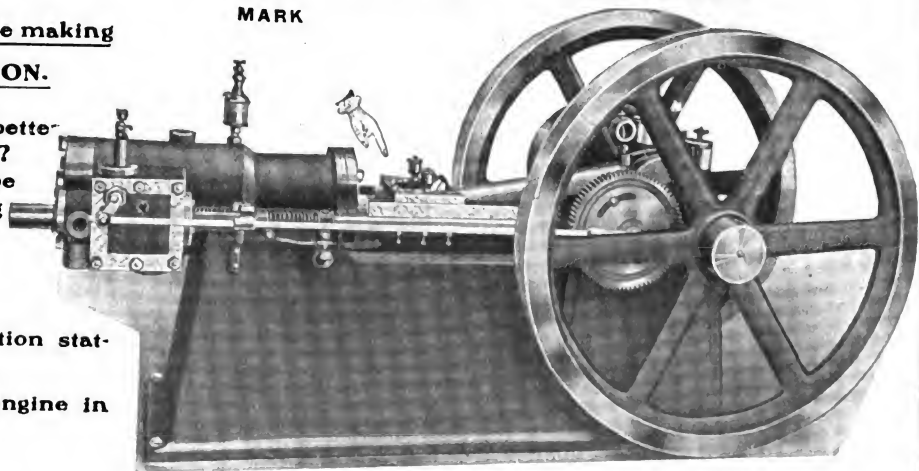
MARK

**5 STRAIGHT LINE PISTON.**

Do you know of anything better in Gas Engine Construction? No wear on cylinder, no escape of power, consequently a big saving in fuel.

Write for further information stating size.

Attractive offer for first engine in your locality.



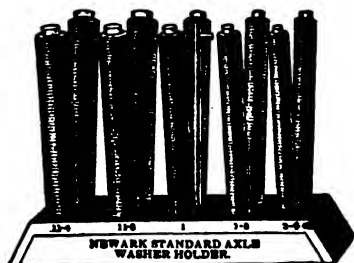
From 4 to 15 H. P. single cylinder. From 16 to 30 H. P. double cylinder.

**TRIED and TRUE. Our engine sold, stays sold—No kick coming.**

MADE ONLY BY

**THE ROBERTSON MFG. CO.****BUFFALO, N. Y., U. S. A.**

# SOLID LEATHER AXLE WASHERS



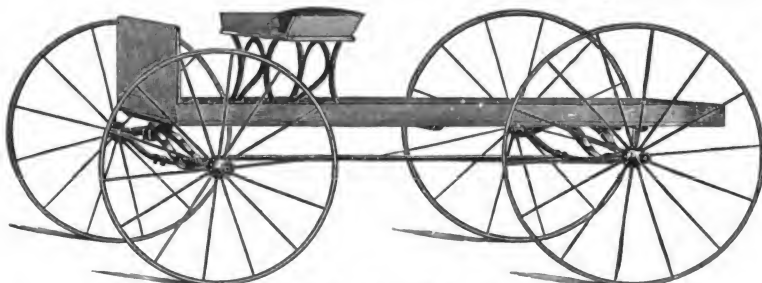
**A novelty in our Patent Axle Washer Holder. Holds 500 Newark Standard Axle Washers.** Every carriage repairman ought to have one. Handiest thing around the shop. "Standard" and "I.X.L." brands Solid Sole Leather Axle Washers are our specialty. We make washers for every axle on the market. Also a full line of

**Pump Leathers and Leather Horseshoe Soles.**

Write now for Prices, Illustrated descriptive circular and **FREE SAMPLE of Our Washers** and mention this publication.

**If your dealer cannot supply you we will send you one of our racks along with 500 Standard Axle Washers, Express prepaid, on receipt of \$3.00**

**The Newark Leather Washer Mfg. Co., Newark, N. J.**

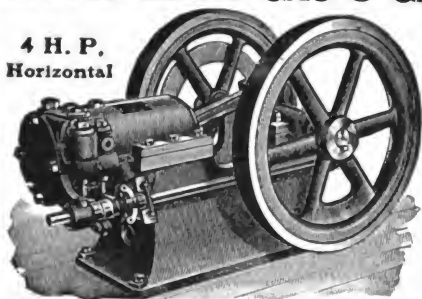


Write for Catalog and prices on full line of gears.

**PEERLESS MILK WAGON (Short turn)**  
**FORSBURG SPRING AND GEAR CO., ROME, N. Y.**

## LITTLE GIANT GAS & GASOLINE ENGINES

**4 H. P. Horizontal**



Either tube igniter or electric igniter. Shipped mounted on skids, if desired for farm use.

**2½ H.P. Vertical**



Also equipped with pumping attachments. Write for booklet describing full line New Era Gas Engines from 4 to 100 H. P. Special inducements to dealers as agents.

**THE NEW ERA GAS ENGINE CO.**  
No. 63 Dale Ave., DAYTON, OHIO.

## Less Work and More Money

A GUARANTEE MADE TO USERS OF

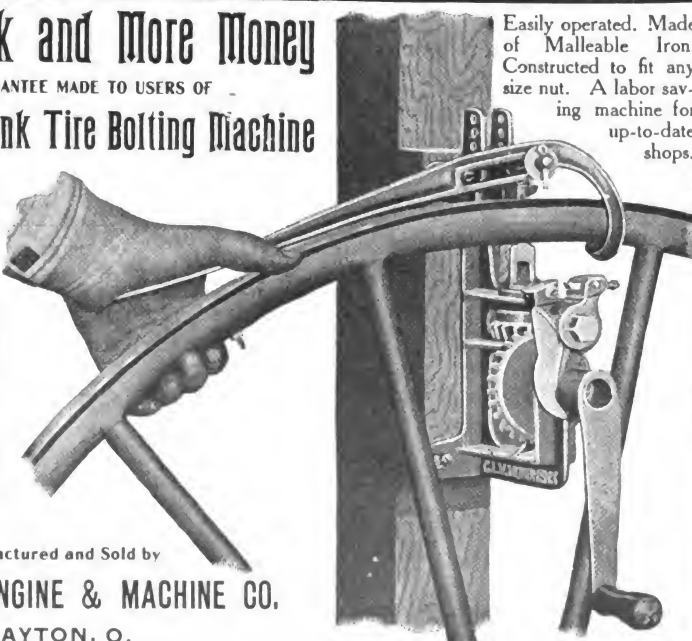
## The Mundhenk Tire Bolting Machine

Mundhenk's Tire Bolter is the Only Machine that Will Successfully Remove all Burrs, Run Them On or Clip Ends off Tire Bolt Perfectly Smooth in 2 minutes' time.

Send for one of our interesting circulars and let us tell you all about it.

Manufactured and Sold by

**RILEY GAS ENGINE & MACHINE CO.**  
DAYTON, O.



Easily operated. Made of Malleable Iron. Constructed to fit any size nut. A labor saving machine for up-to-date shops.

## THE "BUSH" Low-down Handy Wagon

WITH 4-IN. TIRE STEEL WHEELS

Our wagons are well ironed throughout—wheels made with round staggered spokes.



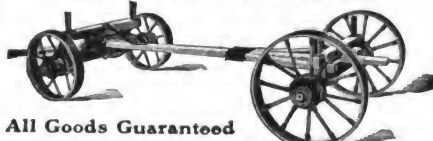
We make any size wheels to fit any skein.

We manufacture a complete line of metal wheels for corn planters, cultivators, plows, etc.

WRITE TO **C. BUSH, QUINCY, ILL.**  
(MENTION THIS PAPER.)

## THE GENEVA Handy Farm Wagon

THE BEST METAL WHEEL WAGON MADE.



All Goods Guaranteed

Pressed steel wheels, any height and width tire, interchangeable hubs. Gears of selected stock, thoroughly ironed. Made in several styles.

WE ARE ESTABLISHING ONE AGENT IN EVERY TOWN.  
Send for Descriptive Circulars to

**Geneva Metal Wheel Co.**  
GENEVA, OHIO

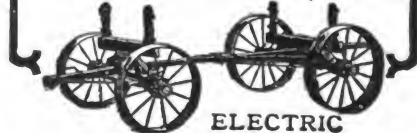
## Let Us Send You Our Book.

about good wheels and good wagons that will save you a lot of work and make you a lot of money—the **ELECTRIC STEEL WHEELS**

and the **ELECTRIC HANDY WAGON.**

By every test, they are the best. More than one and a quarter millions sold. Spokes united to the hub. Can't work loose. A set of our wheels will make your old wagon new. Catalogue free.

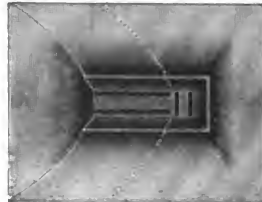
**ELECTRIC WHEEL CO., P. O. Box A Quincy, Ills.**



ELECTRIC

## Thompson's Extension Tuyere Iron

Best Made Thousands in Use Strong and Heavy



Size 15x20 ins. Weight 65 lbs. Depth 5½ ins.

## A BLACKSMITH'S DELIGHT

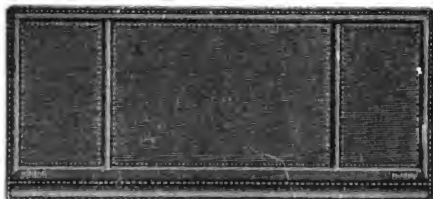
This Tuyere Iron and Fire Pot saves time, coal and money. Its no experiment. Can get a fire from 2 to 24 inches long. GUARANTEED. WHY NOT HAVE THE BEST? WILL PAY FOR ITSELF IN SHORT TIME. Ask your jobber to supply you or write us direct.

**THOMPSON TUYERE IRON CO.**  
INDIANAPOLIS, IND., U. S. A.

8 YEARS  
WEAR AND  
TEAR

# Metallic Dashes

PROVE  
THEIR  
EXCELLENCE

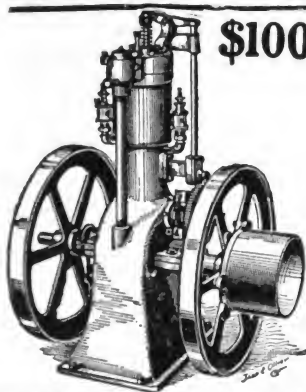


HIGH IN QUALITY  
LOW IN PRICE  
FINISH EQUAL TO BEST PATENT  
LEATHER, BUT MORE DURABLE

For Sale by your Jobber. If not,  
write us.

Send for Catalogue.

**BENNETT MFG. CO., Hunt, N. Y. BOX 506.**



## \$100 The New Pierce Gasoline Motor IS A WONDER.

It will develop more power on less fuel  
than any other make in the world ....

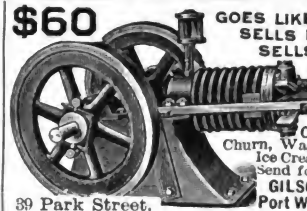
Built on modern lines and up to the very latest practice; made from the best material, and with ordinary care will last a life time.  
We have been building Gasoline Motors for over twenty years. More than 12,000  
PIERCE MOTORS are in use in all parts of the world. We know how to, and do,  
build them right, in fact, we

**Guarantee Them to Give Satisfaction.  
If they do not, send them back and we  
will refund your money in full. . . .**

The PIERCE MOTORS are the best in the world and cost less than the poorest.  
We guarantee them against defective material for life. If you want power for any purpose, write for our printed matter, stating your needs. We also build other sizes up to  
100 H. P., also Marine Motors, Launches and Auto Boats. Be sure and address

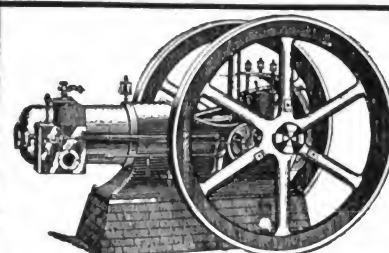
**PIERCE ENGINE COMPANY, - Dept. 12, Racine, Wis.**  
3 1-2 Actual Horse Power.

**\$60**



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SELLS LIKE SIXTY  
SELLS FOR SIXTY**  
**GASOLINE  
ENGINES**  
for Pumping,  
Cream Separator,  
Churn, Washing Machine,  
Ice Cream Freezer, etc.  
Send for catalogue.  
**GILSON MFG. CO.**  
Port Washington, Wis.

89 Park Street.



Why buy an experimental gas engine, when for the same money you can buy one that has stood the test for twelve years, and have the further advantage of being able to use it either with gasoline or kerosene. Built in sizes of from 2 to 100 H.P. Write for our large catalogue and prices, if interested.  
**MODEL GAS ENGINE WORKS**  
Lock Box 2003, AUBURN, INDIANA  
New York Office, B-21 Produce Exchange.

## THE SINNING GAS ENGINE

Is the simplest, most durable,  
and most reliable on the market

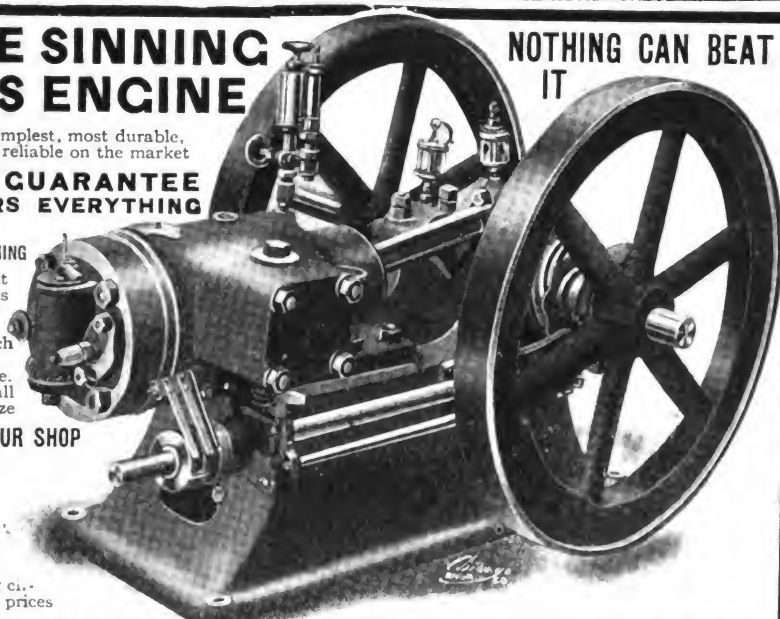
**OUR GUARANTEE  
COVERS EVERYTHING**

THE SINNING

is cheapest  
to run, has  
few working  
parts, all of which  
are interchangeable.  
Bearings all  
hard bronze

**EQUIP YOUR SHOP  
with the  
VERY  
BEST**

Write for  
interesting circulars and prices



**NOTHING CAN BEAT  
IT**

**THE CHARLES SINNING MACHINE WORKS** 242 DICKSON STREET  
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## A TURN FOR THE BEST

Every dealer turns profits his way when he  
takes on a line of

### EUREKA VEHICLES

Everything that goes into them is the best we  
can buy or make. This means that your customers  
will be pleased with them. You will get  
compliments instead of complaints.

Easy to sell because quality is high and prices are low.  
Profitable because quickly sold on liberal margin.  
Write to us and let us tell you.

**NEW EUREKA CARRIAGE AND HARNESS CO.**  
CINCINNATI, OHIO.

Wheels in the white, or finished  
complete, with or without rubber  
tires. Buggy Tops in all sizes,  
grades and prices.



## ONLY ONE TO A CUSTOMER

AT THIS SPECIAL LOW SAMPLE ORDER PRICE



**\$50.00** buys a RUBBER TIRED BUGGY. Fine  
Leather Top. Tires Warranted.

RUBBER TIRED RUNABOUT for only  
Quality, Material and Workmanship Fully  
Guaranteed. At These Special Prices f.o.b. Cars, Cincinnati.

**\$40.00**



REFERENCES:—Bradstreet's or Dunn's Mercantile Agency. All inquiries promptly answered. Write for catalogue and information.

**The Hickory Carriage Company**

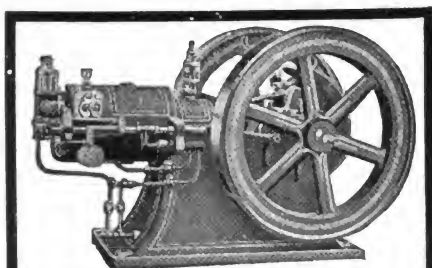
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MAKERS OF STANDARD GOODS

**SOUTH STREET**

**CINCINNATI, OHIO**



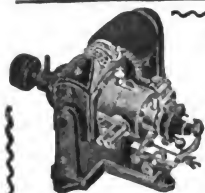


## MICHIGAN

### Three and One-Half Horse

A gasoline engine of full  $3\frac{1}{2}$  guaranteed horse power. In every way suited to general blacksmith and machine shop work. Reliable in construction and reasonable in price. Special price on first engine in any locality, and good terms for agents. Other sizes 2 to 6 horse power for light power uses. Send for free book "Proof-Positive" shows how the engines are used and letters from the users.

**The Nation Engineering Co.,**  
Saginaw, Michigan.



To Gas Engine Operators.  
Dynamo Ignition.

## Motsinger Auto-Sparker

No battery to start or run. The original speed-controlled friction-drive Dynamo. Driven parallel with engine shaft. No belts. No beveled pulley or beveled fly wheel necessary. For make and break and jump-spark system. Water and dust proof. FULLY GUARANTEED.

We have an attractive proposition for the Dealer in Gas Engine lines. Correspondence solicited.

Write for 32-page catalogue, FREE.  
MOTSINGER DEVICE MANUFACTURING CO.  
33 Main Street, Pendleton, Ind., U.S.A.

## New Era Electric BLOWER

Direct connected, has been designed especially for the blacksmith, and it is his ever ready helper that works for less than five cents a day, and never tires. It places him on an equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.

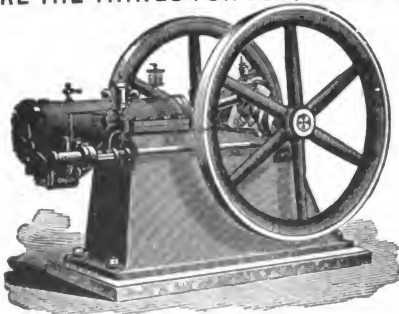
NEW ERA ELECTRIC CO.

Write for circular and particulars.

942  
W. Lake St.  
CHICAGO.

## COLUMBUS GASOLINE ENGINES

ARE THE THINGS FOR BLACKSMITHS



Send for Catalogue 33, Stating Horse Power You Need.

**COLUMBUS MACHINE COMPANY**  
Columbus, Ohio.

Style No. 6,  
Cyclone  
Portable  
Forge.



Easy  
Running.  
Powerful.  
Large  
Capacity.

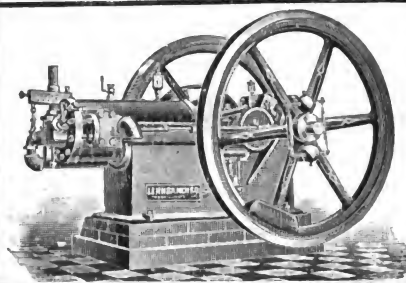
Our  
Free  
Catalogue  
illustrates  
more  
than 20  
other styles

## CYCLONE PORTABLE FORGE

The Cyclone Portable Forge, shown here, is a favorite everywhere. Suitable for heavy, as well as light work. Has a 28x40 in. hearth, large capacity coal box and a 14 in. fan. The deep firebox and powerful blast make the Cyclone Style No. 6 capable of doing the heaviest kind of work. The Cyclone has double Ratchet, Adjustable Legs, Solid Frame, Detachable Lever hung on Ball Joint and swinging in chilled seat. FULLY GUARANTEED.

Write today for our FREE Catalogue and SPECIAL INTRODUCTORY PRICES.

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28 Sheridan Ave. SPRINGFIELD, OHIO.



## Lennox Gasoline Engines

MADE IN ALL SIZES.

Built especially for Blacksmith shop power. It means money in your pocket to find out about our engines before placing your order.

WRITE AT ONCE FOR NEW FREE CATALOGUE.

**Lennox Machine Company,**  
110 9th Ave., MARSHALLTOWN, IA.

## Perfect Cooling with Small Water Supply

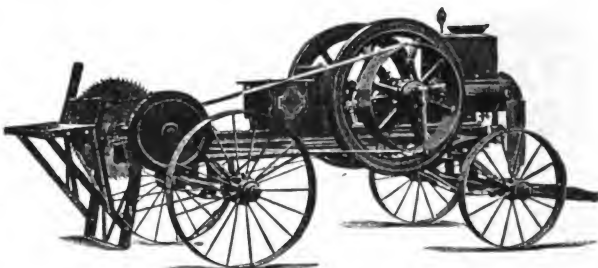
Attractive proposition, isn't it?  
This is only one of the many  
SPECIAL features found on the

### "EASY STARTING" LAUSON LINE.

5, 6 and 8 H. P. Self-Contained  
Hopper Cooler. 6 to 20 H. P. with  
Improved Screen Cooler.

Write for 1905 Catalog and Dealers' Discounts. Mention this paper.

STATIONARY and PORTABLE,  
with or without Saw Attachment.



"LAUSON" SPECIAL, with Saw Attachment.

**THE JOHN LAUSON MFG. CO., New Holstein, Wis.**

## OTTO ENGINES

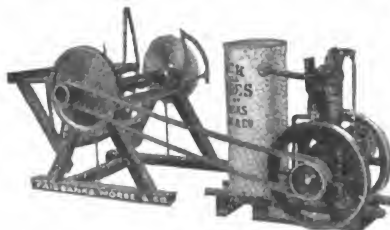
### A Story with a Moral

A. A. Breder, Egg Harbor City, N. J. writes: "Please send by mail one blade for igniter lever, engine number 7185. This is my first order for repairs and I have had my engine since October 3, 1900."

The part cost Mr. Breder 25 cents. Divide 5 years into 25 cents and find the annual cost of maintaining the engine. The moral is obvious.



**OTTO GAS ENGINE WORKS, Phila., Pa.**  
**STANDARD OF THE WORLD**



## Fairbanks-Morse Jack-of-all-Trades

Gasoline Engine will saw more wood than any other 2 H. P. Gasoline Engine.

It is sent all set up and ready to run.

Awarded Gold Medals at World's Fair, 1904

Cut out complete advertisement and send to

**FAIRBANKS, MORSE & CO., Monroe St., Chicago, Ill.**

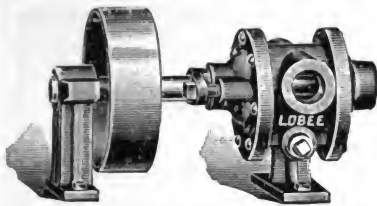
Please send me illustrated Catalogue No. H487 Gasoline Engines. I may want..... H. P.

Engine to run.....

Name..... Street No.....

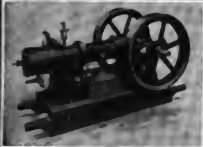
Town..... State.....





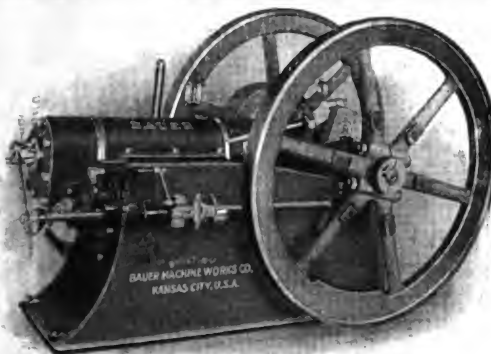
**IT WILL PAY YOU**  
to investigate the merits of the  
**LOBEE ROTARY PUMP**  
for circulating the water of your engine. Are the mos.  
universally endorsed of any pump made. Write for circular  
**Lobee Pump and Machinery Company,**  
182 Terrace, Buffalo, N. Y.

**THE "ELI" LEADS 'EM ALL**



**THE "FOOL-PROOF"  
GASOLENE  
ENGINE**

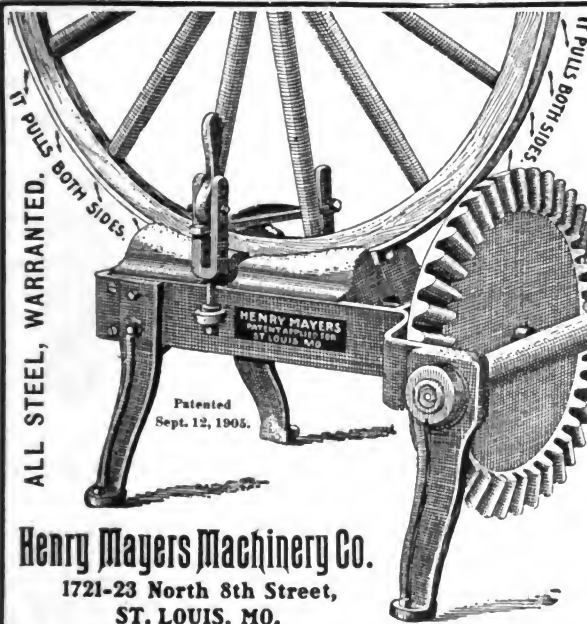
The "ELI" GasoleneFarm Engine is the only fit engine to have on a farm, where one is a good way from the repair shop. The "ELI" is so simple that there's nothing to get out of order. It will run year in and year out without the tinkering that other engines require. It is the only engine without cams, gears, and levers. We call it "Fool-Proof" because, if some simpleton or a child should monkey with it, he couldn't make it dangerous. It is absolutely safe. Isn't that the kind of an engine YOU want? Then write for our free booklet, telling how and why it is so simple and safe.  
**MOLINE PUMP COMPANY, Sole Mfrs.,**  
**MOLINE, ILL.**



**BAUER GASOLINE  
ENGINES..**

The Acme of Simplicity and Perfection.  
If you will examine and compare, piece by piece, you will say there is no other quite so good as the "Bauer." All sizes from 1 1/2 to 20 H.P. Write at once for free catalogue containing long list of letters from satisfied users. Our prices are also very interesting, considering quality.  
**THE FIRST BLACKSMITH** in any town who buys of us gets the agency for his locality, a discount on his purchase, and a commission on his sales. A good engine sells readily. The Bauer is the best.

Write us Today.  
**Bauer Machine Works Co.**  
115-120 W. 18th St., KANSAS CITY, MO.



**Mayers Cold  
Tire Setter**

The only Cold Tire Setter made in which both heads come together at same time. Grip keys set themselves.

**WE  
HAVE  
MOVED  
INTO  
OUR  
NEW  
FACTORY**

(see new address), and hope, with Greatly increased Facilities to be able to Fill All Orders Next Season.

**Henry Mayers Machinery Co.**  
1721-23 North 8th Street,  
ST. LOUIS, MO.

**IT DOES THE TRICK! R. F. D. SPECIAL**



This axle runs easier than any other, and requires no attention. "It's a Wonder." **STANDARD HALL AXLE WORKS, Lancaster, Pa.**

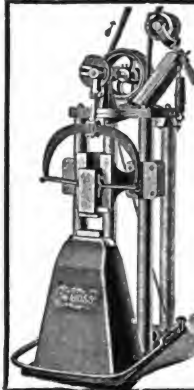
**BUILD YOUR OWN GASOLENE MOTOR**



We supply the castings, drawings and all accessories. A complete line of rough castings, also finished Motors for Bicycle, Automobile, Marine or Stationary. A 2-cent stamp gets our catalogue.



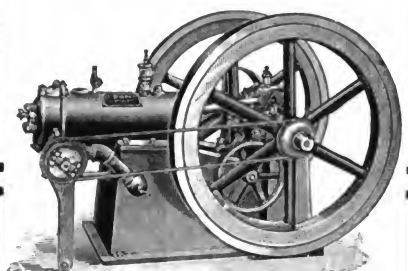
**STEFFEY MFG. CO.**  
2941 Girard Ave., Philadelphia, Pa.



**NOVELTY  
IRON WORKS.  
BOSS  
HAMMER**

For Plow Work, Wagon Work, Heavy Work, Any Work.  
"I have got a Hammer and a good one. I bought one of your hammers, 'The Boss' and it is fine on plow work. It can't be beat on all work."  
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**HAGEN  
GAS AND GASOLINE  
ENGINES**



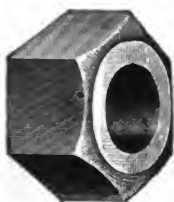
(2-28 H. P.)

**ECONOMICAL and RELIABLE POWER FOR THE  
SHOP-RUNNING BLACKSMITH and  
WAGON MAKER.**

**HAGEN ENGINES** are recommended on account of their simplicity, durability, comparatively low price, small cost of operating and the ease and certainty with which they can be controlled.

Our Catalogue explains all working parts. A postal will bring a copy to you. It's free. Write today.

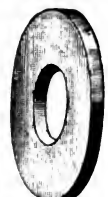
**HAGEN  
GAS ENGINE AND MFG. CO.**  
Winchester, Ky., U. S. A.



**"MILTON"  
NUTS AND WASHERS**

are not only accurate in size and well finished, but the price will interest you. Catalog.

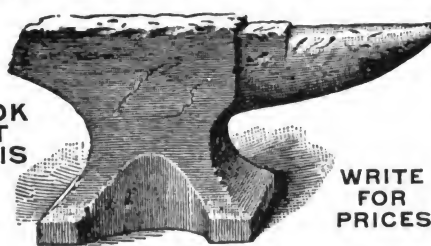
**MILTON MANUFACTURING CO., MILTON, PENNA.**



No. 2.

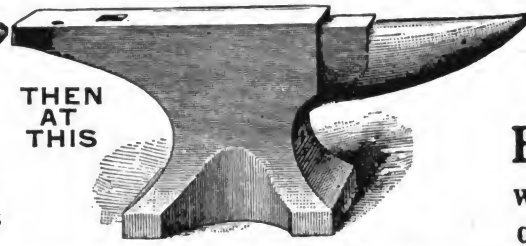
NO MATTER HOW BADLY THEY ARE BROKEN WE CAN REPAIR THEM IN GOOD SHAPE

LOOK  
AT  
THIS



THEN  
AT  
THIS

WRITE  
FOR  
PRICES



**Columbus  
Anvil and  
Forging Co.,**

West Frankfort St.,  
COLUMBUS, OHIO.

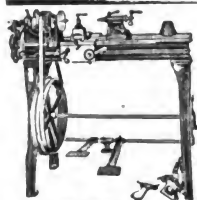
WE ARE EXPERTS AT REPAIRING OLD WROUGHT ANVILS.

WE ALSO MANUFACTURE THE CELEBRATED ARM AND HAMMER BRAND ANVIL.

ASK YOUR DEALER FOR THEM.

## HONEST DEALINGS

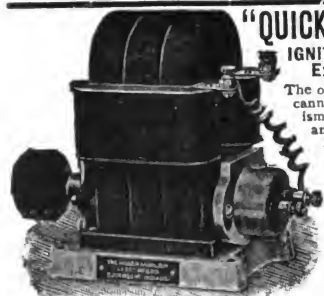
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We also make Wood Lathes from 6 in. to 14 in. swing. If you are in the market for any tools, our catalogue will be mailed free to any address. Shall we mail you one?

Carroll-Jameson Machine  
Tool Co.  
Batavia, Ohio.



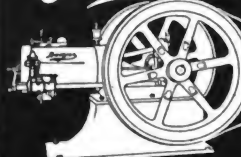
## "QUICK ACTION"

IGNITING DYNAMOS  
Excel All Others!

The only generator that cannot lose its magnetism. For either make and break, or jump spark work. Also spark coils. Send for Catalogue B.

The  
Knoblock-  
Heideman  
Mfg. Co.,  
SOUTH BEND,  
IND.

*Badger*



"The world's standard for efficiency"

## BADGER GASOLINE ENGINES Turn Time Into Money

Badger Engines enable the blacksmith to make the most money out of his time by enabling him to do more, better and a greater variety of work, and at the same time employ less help—saving cost of helpers.

The "Badger" stands for superior excellence and efficiency the world over.

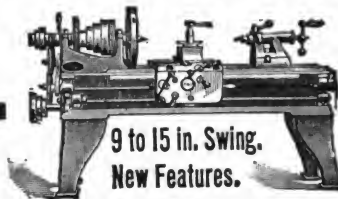
Badger Engines are easy to start and to keep going; cost almost nothing for repairs and last a life-time. They are as cheap as is consistent with best skilled workmanship.

Send at once for our Fine Book, illustrated in colors—it's FREE. It tells all about Badger Gasoline Engines, and why they are the best on earth for the Blacksmith. Write today, before the books are gone.

Special discount to Blacksmiths who take an agency.  
Write for attractive terms.

C. P. & J. LAUSON,  
103 W. Water St., Milwaukee, Wis.

£3



9 to 15 in. Swing.  
New Features.

SEBASTIAN LATHES are Good Lathes

Catalogue Free. Sizes 9, 10, 13, 15 Inches.

Our engine lathes are provided with both screw and rod feeds as well as power cross feed. Gears to cut all standard threads from 5 to 36 are furnished. Steady and follower rests, large and small face plates and countershaft go with each Lathe. Foot Lathes, Tools and Supplies.

SEBASTIAN LATHE CO.

124-126 Culvert Street,

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The Ideal Steel Toe Calk

Write for Circular and Prices.

THE WEYBURN COMPANY  
Rockford, Illinois.

## THE WATERLOO BOY

Our Blacksmith's Special  
3½ to 4 H. P.

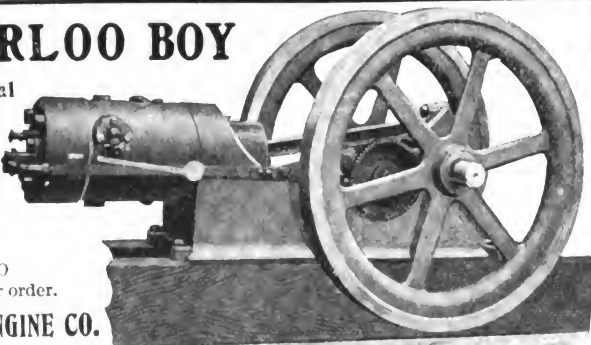
## GASOLINE ENGINE

The Engine Is Right!  
The Price Is Right!

Investigate the WATERLOO  
before placing your order.

WATERLOO GASOLINE ENGINE CO.

WATERLOO, IOWA



## Success Oscillating Sleigh Knees.

For farm, road and  
lumbering Bobs.

Sizes, 1½, 1¾, 2, 2½,  
3, x 3½ in. runners.  
Satisfaction Sure.  
Try Sample Set.



PATENTED



Valley City Bent Knee Bob Sleighs

For Pleasure, Delivery,  
Express, Sleigh, etc.

The Strongest,  
Neatest,  
and Best.



THIS is the Brown Oscillating Sleigh Knee.  
Needs No Recommendation.  
Satisfaction Guaranteed.

Sizes, 1½, 1¾, 1¾,  
2, 2½, 3 and  
3½.

Write for  
circular and  
prices on our  
complete  
line of  
sleigh goods.

Sherwood Hall Co., Ltd., 24-28 IONIA ST., GRAND RAPIDS, MICH.

# TOOLS

FOR THE  
HORSESHOER  
AND

BLACKSMITH  
IS OUR SPECIALTY



New Rounding Hammer.

FREE—a catalogue and hanger giving a table which will enable you to cut horseshoe moulds to any weight without waste.

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Meadville, Pa.

LIVINGSTON NAIL COMPANY, 104 Reade St.,  
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# DON'T BUY GASOLINE ENGINES

all one-cylinder engines; revolutionizing gas power. Costs Less to Buy and Less to Run. Quickly, easily started. No vibration. Can be mounted on any wagon at small cost—portable, stationary or traction. Mention this paper, SEND FOR CATALOGUE. THE TEMPLE PUMP CO., Mfrs., Meagher & 16th Sts., Chicago. THIS IS OUR FIFTY-SECOND YEAR.

UNTIL YOU INVESTIGATE  
"THE MASTER WORKMAN."

**PATENTS that PROTECT—**  
Our 3 books for inventors mailed on receipt of 6 cts. stamps.  
R.S. & A.B. LACEY, Washington, D.C. Estab. 1889.

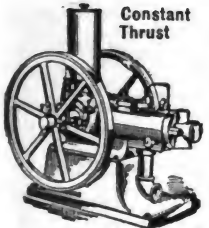
## "BRAZE CAST IRON WITH BRAZIRON"

Our Customers Say,

"Samples worked fine, send me an Outfit."  
"Much pleased with Braziron"  
"Works all right."  
"Your Braziron is a wonder."  
"More than you claim."  
"Have done a number of jobs with Braziron and all were a fine success."  
"Have brazed castings up to 8000 lbs. weight with Braziron."  
"Brazed a broken eccentric strap for 60 H. P. engine, made a perfect joint."  
You too can increase your business and make money with Braziron.  
Send 10 two-cent stamps for trial package of Braziron and flux sufficient for several jobs.

**A. & J. MANUFACTURING CO.,**  
No. 18 Randolph St., Chicago, Ill.

## The MIETZ & WEISS Oil and Gas Engines



Constant Thrust

STATIONARY and MARINE  
1-60 H. P.

Adopted by the U.S. and Foreign Governments.

Most Economical and Safest Power known. Runs with common kerosene, distillate or fuel oils.

It will pay you to consult me before placing your order elsewhere.

For all Power Purposes. Thousands in use. Highest award for Direct Coupled Engine and Dynamo, Paris Exposition, 1900.

Gold Medal, Pan-American Exposition, 1901.  
Gold Medal, Charleston, S. C., Exposition, 1902.  
Gold Medal, Louisiana Purchase Exposition.

**A. MIETZ,** 128-138 Mott St., New York  
Send for Catalogue, Dep. 34.

## Have You an Engine?

If so, *The Practical Gas Engineer* will tell you how to get the best results from it. A plainly written book telling how to erect, operate and care for gas and gasoline engines. Cloth bound, 152 pages. Sent prepaid, for \$1.00.

**AMERICAN BLACKSMITH CO.**  
BOX 974, BUFFALO, N. Y.

## PATENTS

Promptly Secured.  
Highest references from prominent Manufacturers  
Write for Inventors' Hand Book.  
SHEPHERD & PARKER, 850 F St., Washington D. C.

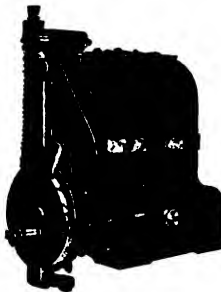
## ECLIPSE GAS AND GASOLINE ENGINES.

Vertical 2, 3, 4, 5, H. P.  
Horizontal 5, 10, 12, 15, 20, 25, H. P.

Designed and Built for BUSINESS.  
Catalogue on request.

**MYRICK MACHINE CO.,** Olean, N. Y.

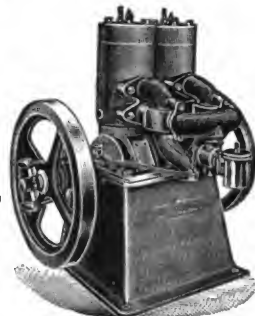
## Read This Guarantee



The Goodson Igniter is guaranteed to produce a sufficient spark to start a gas or gasoline engine without batteries or spark coil.  
Send for Catalogue.

**Goodson Electric Ignition Co.**

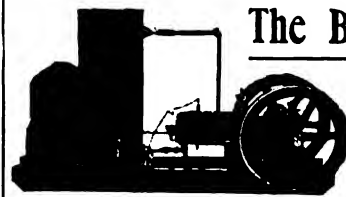
95 Point Street,  
PROVIDENCE, R. I.



## The Maxwell & Fitch Gasoline Engine

Two cycle, a power impulse every revolution, we use no gears, cams, cam shafts, valves or valve springs, no engine can be simpler or more durable. If you want a well built engine, one built of the best materials, then just send us a postal for our catalogue and price list.

**THE MAXWELL & FITCH CO.**  
ROME, N. Y.



## The Beaver

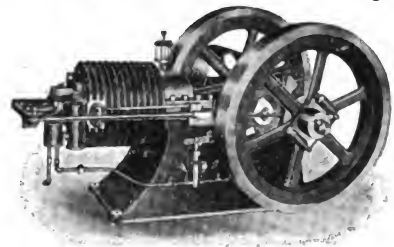
3½ & 6 H. P.  
gasoline engine  
all complete  
ready to

run. Can be moved anywhere.

Agents Wanted. Write Us.

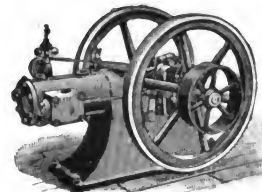
**BEAVER ENGINE CO.** 222 East 2nd Street,  
CINCINNATI, O.

## The GADE Air Cooled Gasoline Engines



Made in 2, 3 and 6 horse power sizes. What's the use of paying good money for an old style engine, when you can get something better in the "Gade Air Cooled" at the same cost. Buy one. It will not freeze up or go back on you in cold weather. It's ready for business all the time. We know it will please. By all means write for descriptive circulars and price list of the "Gade." Address, **GADE MFG. CO.,** Iowa Falls, Iowa.

## THE ENGINE THAT MEETS THE DEMAND OF THE DAY



## THE "WATKINS"

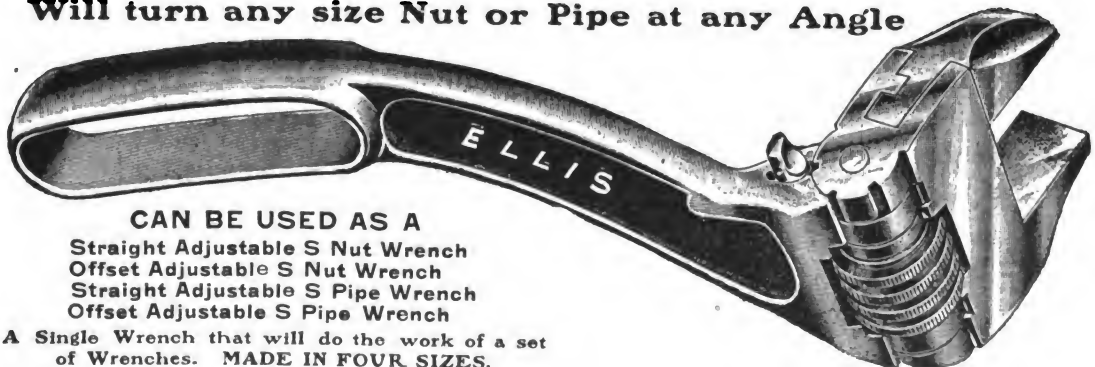
It has always been our aim to build the best engines possible, regardless of cost, and to so systematize their manufacture that they can be sold at a fair price. All sizes from 2 to 15 H. P.

OUR CATALOG IS AT YOUR SERVICE.

**THE FRANK M. WATKINS MFG. CO.**  
537-549 Baymiller St., CINCINNATI, OHIO.

## The 4 in 1 Ellis Wrench

Will turn any size Nut or Pipe at any Angle



CAN BE USED AS A

Straight Adjustable S Nut Wrench  
Offset Adjustable S Nut Wrench  
Straight Adjustable S Pipe Wrench  
Offset Adjustable S Pipe Wrench

A Single Wrench that will do the work of a set of Wrenches. MADE IN FOUR SIZES.

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Machinery, Metals, Hardware, Tools and Supplies,

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All grades from Merchant Tool Steel to  
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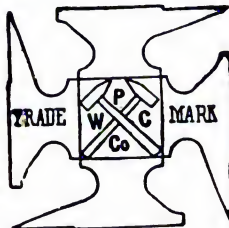




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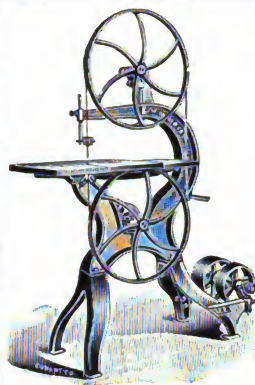
*To Make a Strong, Clean Weld If You  
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We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



Perfection Welding Compound will do the trick quickly and neatly. It makes a stronger weld than any other compound manufactured, as proven by the tests it has undergone. Send for free sample.

PRICE CONSISTENT WITH QUALITY.  
**PERFECTION WELDING COMPOUND CO., SCRANTON, PA.**



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**Built to Stand  
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A well-made, accurate machine; especially adapted to run by gasoline engine; capable of all kinds of band-sawing, particularly carriage repair work.—These are a few of the fine points of Marston's Band Saw

*We will gladly send Prices and Circulars. Drop us a card.*

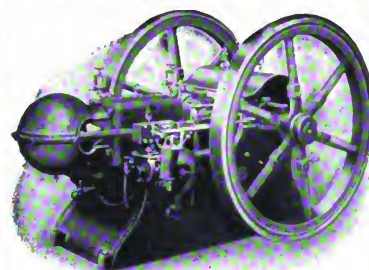
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222 Ruggles St., Boston, Mass. U.S.A.

**1906 IDEAS.**

We will pay a proper sum of money to every blacksmith who sends us during 1906 acceptable ideas for new Buffalo Blacksmith Tools, or for real improvements in existing machines. Our study of the every day experience of the craft is what has always enabled us to put forth the best tools in the world.

Let us hear from you.

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**GAS and GASOLINE ENGINES**

**Are Especially  
Suited for  
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**INVESTIGATE THE****Hercules Hydraulic**

**Before  
You  
Buy a  
Tire Setter**



**National Machine Co.**  
KEOKUK, IA.

**Henderson Hand Power TIRE SETTERS**

Set Tires Cold.  
Keep the Dish right  
Tighten Wood Work  
Pull Broken Spokes  
Jump in New Spokes  
Are Money Makers



**Standard Tire Setter Co.**  
KEOKUK, IA.

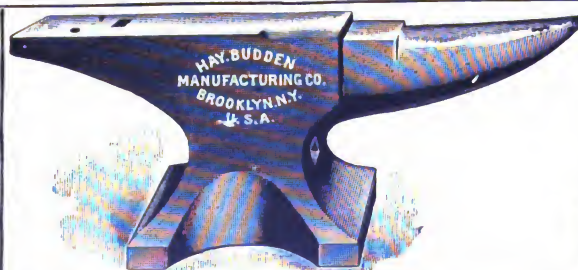
**HAY-BUDDEN SOLID WROUGHT ANVILS**

**The Gold Medal Anvil  
Highest Award**

OMAHA, 1898 PAN-AMERICAN, 1901

Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS.



**OVER 100,000 IN USE**

**WARRANTED**

Experience has proved their worth and demonstrated that "HAY-BUDDEN" Anvils are Superior in Quality, Form and Finish to any on the Market.

**HAY-BUDDEN MFG. CO., BROOKLYN, N. Y.**

# AMERICAN BLACKSMITH

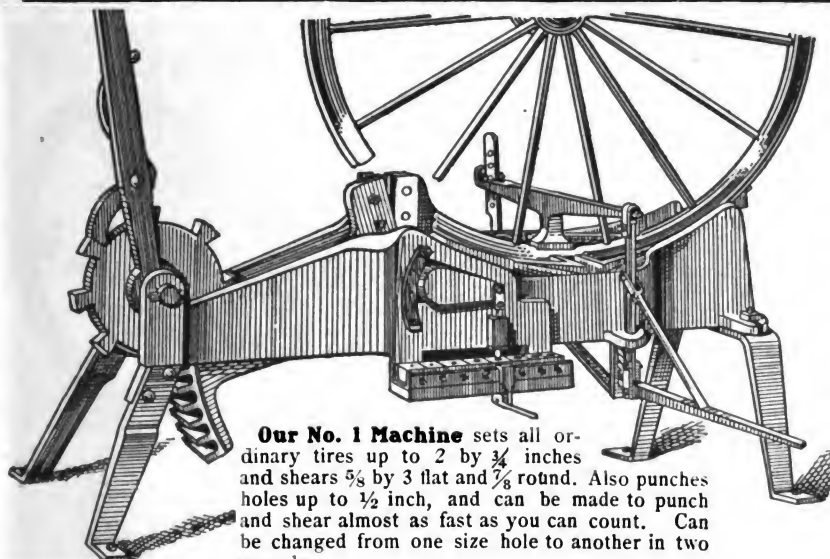
BUFFALO  
N.Y. U.S.A.

A Practical Journal of Blacksmithing and Wagonmaking

FEBRUARY, 1906

\$1.00 A YEAR  
10¢ A COPY

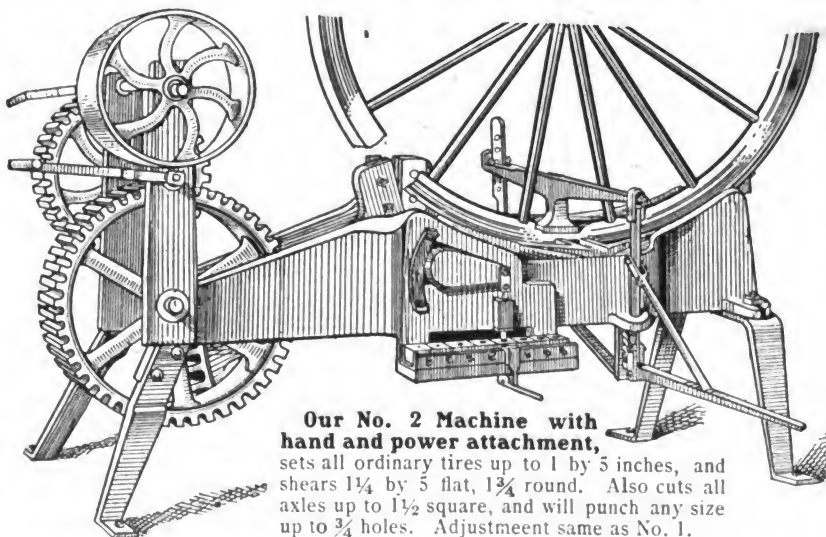
## The New House Cold Tire Setter



**Our No. 1 Machine** sets all ordinary tires up to 2 by  $\frac{3}{4}$  inches and shears  $\frac{5}{8}$  by 3 flat and  $\frac{7}{8}$  round. Also punches holes up to  $\frac{1}{2}$  inch, and can be made to punch and shear almost as fast as you can count. Can be changed from one size hole to another in two seconds.

**Another positive proof** we offer the trade is the fact that hundreds of our customers have used their machines now three and four years, and some have made **\$3,000 to \$5,000 clear** on them and were not out one cent for repairs. Some of them, after having used their machines four years, sold them at original cost, and bought our large improved machine. Out of the thousands now in use not one has been broken up and not one has been abandoned. **Write us for catalogue and prices.**

We claim that our Cold Tire Setter is the **best ever offered to the trade**, and the proof is we have four times as many in actual and successful use as all other makes combined. It is **simple**, and **strong**, and **can't be broken**, or **get out of fix**, the frame having been made solid for tire setting, and using the same frame and lever for the Shear and Punch, makes it the strongest and best in the world. The little additional cost to us is so slight that we make no additional charge for them, thereby making our customers a present of at least an \$80 Shear and Punch.



**Our No. 2 Machine with hand and power attachment**, sets all ordinary tires up to 1 by 5 inches, and shears  $1\frac{1}{4}$  by 5 flat,  $1\frac{3}{4}$  round. Also cuts all axles up to  $1\frac{1}{2}$  square, and will punch any size up to  $\frac{3}{4}$  holes. Adjustment same as No. 1.

## The House Cold Tire Setter Company,

Office and Factory, 216-220 So. Third Street,

St. Louis, Mo.,

and Julius F. House, 40 Church Street, Toronto, Canada.



# Carriage Maker and Blacksmith Tools

Special  
Prices to  
Carriage Makers  
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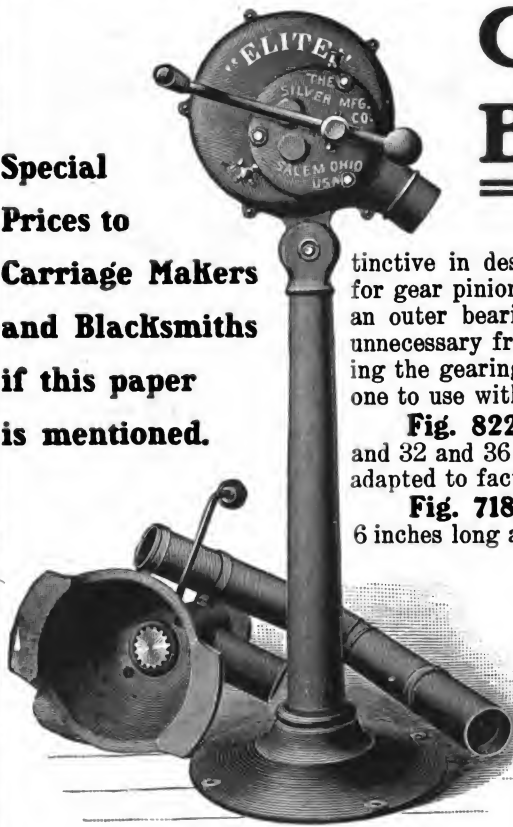


Fig. 900, 12 inches.

**Fig. 900, "Elite," Silver Blower** (*patent applied for*) is distinctive in design, has cut gearing and removable, interchangeable bronze bearings for gear pinions. The gearing is self contained and attached to side of fan case, has an outer bearing plate over it and is thus permanently secured so that there is no unnecessary friction or lost power. The gear covering is removable without disturbing the gearing or paddle spider. There is a light tuyere for clay lining and a heavy one to use without lining. All parts are interchangeable.

**Fig. 822, Band Saws** are made in sizes 20 and 26 inch for foot or belt power and 32 and 36 inch for belt power. They are properly constructed, nicely finished, adapted to factory and repair work of every kind and give unusual satisfaction.

**Fig. 718, Spoke Tenon Machine** cuts tenons  $\frac{1}{8}$  to 2 inches diameter up to 6 inches long and also bores the felloe.

**Fig. 709, Taper Hub Boxing Machine** is made as illustrated, on legs and also without legs to mount on bench. It bores tapering holes in the hubs for the boxes and cuts the recesses for nuts and collars.

Made also for hand and power.

Also Forges, and a complete line of Hand and Power Drills.



Fig. 709.

Manufactured by

— THE —  
**SILVER MFG. CO.,**

365 Broadway,

SALEM, OHIO.

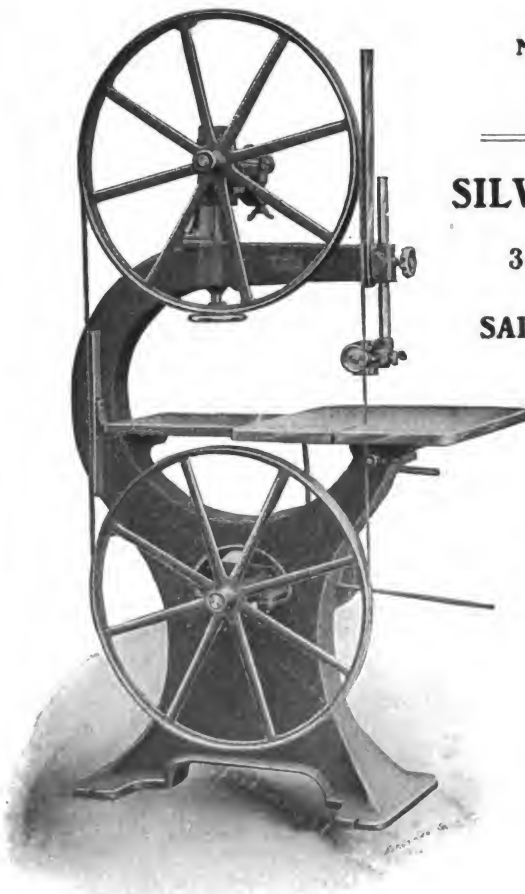


Fig. 822, 32 inch.

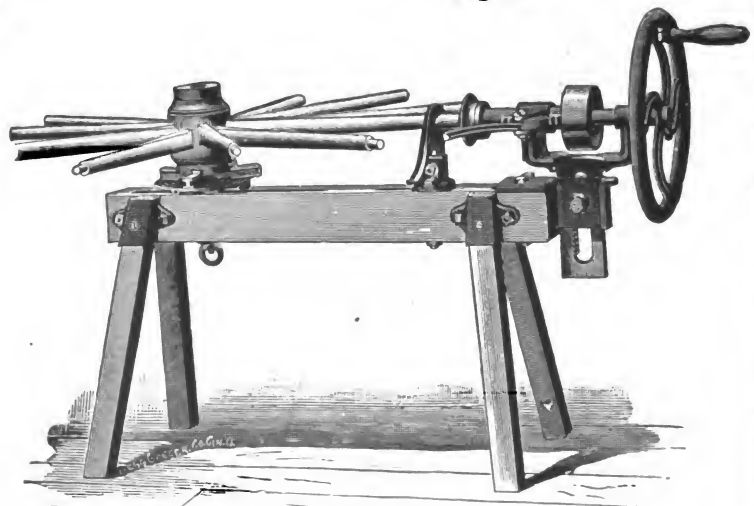
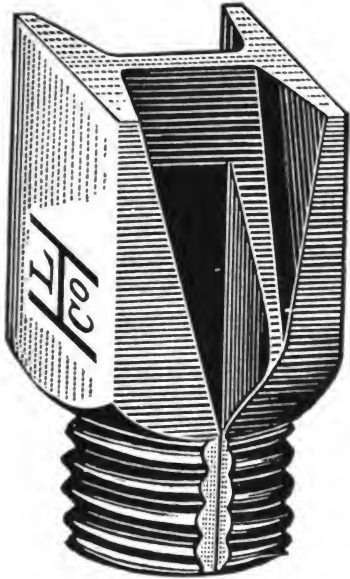


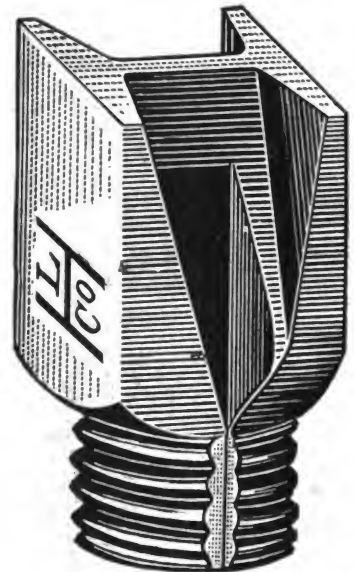
Fig. 718.



# PATENT



# H



# CALK

**ALWAYS SHARP! NO SLIPPING OF THE HORSE.**  
**NO INJURIES AS CAUSED BY OTHER CALKS!**  
**GREAT SAVING OF HORSES AND HORSESHOERS.**

**Guaranteed to Outlast Every Other Device of  
The Kind.**



**WHEN NEW!**

**Can be Removed Even if Worn  
Down to the Shoe.**



**HALF WORN!  
Always Sharp!**

**H Calks have been  
in use over  
25 years**

**Sold to Horseshoers  
Only**

**H Calks have saved more  
horses than all other de-  
vices of the kind together**

**THE ONLY INSERTIBLE HORSE SHOE CALK USED IN THE  
GERMAN, RUSSIAN AND AUSTRIAN ARMIES.**

**Write for Circulars and Price List.**

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**16 Beaver Street**

**NEW YORK CITY**

# No. 16 Western Chief DRILL

Continuous Screw Feed.

Hand Lever Feed.

Fast and Slow Speed.

All Gears are Cut.

Raise and Lower to Table.

Drills to center of 24-inch circle.

Bores 0 to 1½ in.

Spindle runs up and down 8½ inches.

Table runs up and down 16½ inches.

Both Hand  
and Pulley  
Power.

Weighs  
360 lbs.

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**CANEDY-  
OTTO  
MFG.CO.**

CHICAGO  
HEIGHTS  
ILL.

Royal and  
Western Chief  
Forges, Blowers  
and Drills are  
sold by every  
First-class Dealer  
in the World.

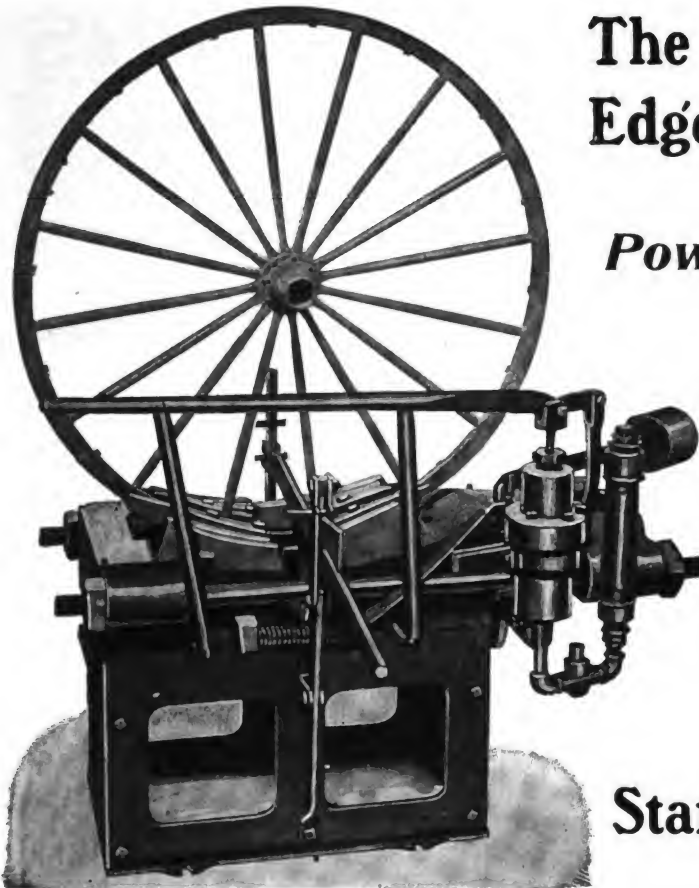
**Ask For  
Them.**

## The Royal Blower

is absolutely free from all spiral or worm gears, and has not a ball bearing in it. Spiral and worm gears are short lived, and ball bearings are not suited to such high speeds. Phosphor bronze is used for the lead gear and bearings; and steel for the pinions and shafts. It is the simplest, lightest running and surest worker of any Blower on this day's market.

FAN, 12 inches diameter.  
FIRE POT, 9x11½ x 4, inside.





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Sets tires cold by a few strokes of a

### Powerful Hydraulic Pump

#### The Warranty Tells the Tale.

It is warranted to work as well in every respect, or better, than any other edge grip tire setter and in addition is warranted to work much

#### EASIER AND QUICKER.

These are two most valuable points in a hand power cold tire setter.

Its gripping jaws grip the tires accurately and let go quickly without the use of hammer.

NEW WELLS, MO., Dec. 19, 1905.  
STANDARD TIRE SETTER CO., Keokuk, Ia

GENTLEMEN This is to certify that in June 1905, I bought a Scientific Hydraulic Cold Tire Setter and for rapidity of work it is unexcelled and is ahead of anything on the market. I can set a tire 11-2x5-8 in five minutes. Have already set tires in less time. It is no trouble for anyone to work it. As far as ease of operation is concerned, will say it is without doubt the easiest operated cold tire setter in the American market and I can say that I am acquainted with all other makes. Wishing you success, I remain  
Yours truly, A. J. VOGEL.

For full information, address,

**Standard Tire Setter Co.**

**KEOKUK, IOWA**

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## Ball Bearing, Leather Packing Automatic Take-Up

QUALITY AND ADVANTAGES CONSIDERED IT IS THE CHEAPEST AND BEST ON THE MARKET

**ALL** STEEL  
RIGHT  
THE TIME

We are prepared to furnish the Buggy Size Shaft Ends with long length irons from 28 to 34 in. long, with 8 or 10-in. "T" piece, irons 5-16 x 1 1/4 in. in section.

**C. C. BRADLEY & SON, Syracuse, N. Y.**



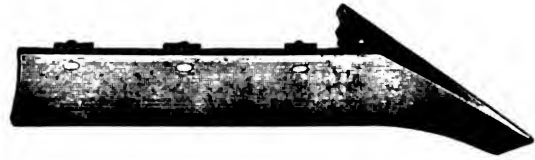
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## HAYSLE FTTED PLOW SHARES.



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BOLTS READY  
TO BOLT ON  
THE PLOW.



We carry these **Fitted Shares** for all the leading plows in use throughout the country. **Exact duplicates of the original.** Made from highest, grades of **crucible** and **soft center steel**, thoroughly **finished, correctly fitted and ready to apply.** We are now manufacturing about one hundred different numbers and adding new ones constantly.

Special plowshares made to order, any quality or style. Send for estimates.

These shares are **guaranteed** to fit the **plows** for which they are **intended** wherever the shares made by the plow company will fit.

**Soft center steel is not guaranteed against breakage.**

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<b>Canton.</b> No. 50—10 in. No. 110—16 in. No. 42A—14 in. No. 46—12 in. No. 54A—16 in. No. 112—14 in. No. 66—12 in. No. 128—14 in. No. 62—9 in. No. 64—10 in.	<b>Deere.</b> No. 13—12 in. No. 31—12 in. No. 33—14 in. No. P33—14 in. No. 42—14 in. No. 46—16 in. No. 037—9 in. No. 049—10 in. No. 038—11 in. No. 059—12 in. No. 40—16 in. <i>Rider.</i> No. 40—16 in. <i>Walker.</i>	<b>Kingman.</b> No. A16—16 in. No. S314—14 in. No. S316—16 in.	<b>Oliver.</b> No. Crescent 8—16 in. No. Crescent 8—14 in. No. 7—12 in. No. ND1—12 in. No. ND2—14 in.	No. FALDI—14 in. <i>Alfalfa.</i> No. FALDI—16 in. <i>Alfalfa.</i> <b>Solid Comfort.</b> No. 134—14 in. No. 138—16 in.	<b>Reliance.</b> <b>Janesville.</b> No. 3R—16 in. No. 2R—14 in. No. 38—14 in.
<b>Rock Island.</b> No. 40—16 in. No. 30—12 in. No. 32—14 in. No. X1—14 in. No. 38—14 in.	<b>Cassaday.</b> No. 517—16 in. No. 515—14 in.	<b>Sattley - Hummer.</b> No. 186—16 in. No. 69—16 in. No. 182—14 in. No. 181—12 in.	<b>Gale.</b> No. A12—12 in. No. A14—14 in. No. A16—16 in.	<b>Peru.</b> No. AL—14 in. No. AL—16 in.	<b>Case.</b> No. AS—12 in. No. AN—12 in. No. AS14L—14 in. No. AS16L—16 in. No. AS—14 in. No. AP—14 in. No. AS—16 in. No. AP—16 in. No. AS—18 in.
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### PRICES.

12-inch Crucible Steel, each.....	\$1.40	Soft Center Steel, each.....	\$1.95
14-inch Crucible Steel, each.....	1.50	Soft Center Steel, each.....	2.20
16-inch Crucible Steel, each.....	1.60	Soft Center Steel, each.....	2.40

## Haysler Blacksmith's Plow Shares.



With heavy upset shin that is unapproachable, the heaviest, smoothest shin in the market; runs way down close to point;

no double shin shares are needed. See illustration. Upper corner is filled full and

smooth. New improved and best shape. They are all drawn under a triphammer, refining the grain of steel along the cutting edge, giving added wear and absolute satisfaction. Made from high-grade crucible steel, solid cast and genuine laid soft center steel. We carry both right and left hand and in following sizes.

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	Solid Cast.	Crucible.	Soft Center.
10 in. 5 1/2 inches wide, each.....	\$ .42	.53	\$ 1.20
11 " 5 1/2 " " ".....	.42	.53	1.20
12 " 5 1/2 " " ".....	.45	.53	1.20
14 " 6 " " ".....	.55	.65	1.35
16 " 6 " " ".....	.65	.75	1.50
18 " 6 " " ".....	.85	1.00	1.75

### Wide Stirring Plow Shares.

	Solid Cast.	Crucible.	Soft Center.
12 in. 6 inches wide, each.....	\$ .48	.58	\$ 1.20
14 in. 6 1/2 " " ".....	.58	.70	1.35
16 in. 6 1/2 " " ".....	.68	.80	1.50
18 in. 6 1/2 " " ".....	.90	1.10	1.75

### Plain Breaker Shares.

	Solid Cast Steel.	Soft Center Steel.
12 in. 6 1/2 inches wide, each.....	\$ .60	\$ 1.30
14 in. 6 1/2 " " ".....	.70	1.50
16 in. 6 1/2 " " ".....	.80	1.75
18 in. 6 1/2 " " ".....	1.00	1.95

We can also furnish Rod breaker shares on any of the above sizes made of 3-16 inch steel, by shipping from factory direct. If in need of anything not listed above, kindly write us.

**Our No. 63 Bargain Catalogue containing 180 pages of rock bottom prices on every kind of plow goods and blacksmiths' supplies is now ready for YOU. It's free.**

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# HAYSLE IRON COMPANY

## KANSAS CITY, MO.





## At ANY Price.

**MORGAN & WRIGHT PADS**  
are the most desirable pads  
on the market.

Strong; well-made; durable; easy to fit; sizes run larger than other brands.

They have proven from the very first to be **exceptionally good pads for the horse.**

They have educated hundreds of horse owners to the "sticking point" in the use of pads by **proving** that their use not only saves veterinary bills, but that they **help the horse to do his best.**

They have helped horseshoers everywhere both to **hold** and to **increase** their pad business.

You can't pull "smiths" who use them **away** from them with a Borax 20-mule team.

There's a pad for every purpose—15 in all. Make the test **yourself.**

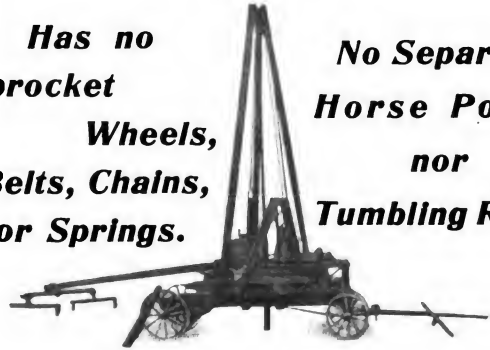
**MORGAN & WRIGHT,**  
**CHICAGO.**



## OUR ROTARY DRILL

*Has no  
Sprocket  
Wheels,  
Belts, Chains,  
or Springs.*

*No Separate  
Horse Power  
nor  
Tumbling Rods.*



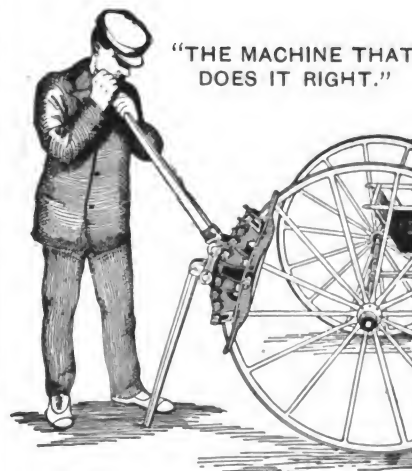
## THE POWER IS DIRECT TO THE MACHINE

It is easy work for one man and one team to drill to the depth of 400 feet. One man and one team can set it up and begin drilling in 10 minutes.

Drill turns its own rope and drill bit never strikes twice in the same place, as drill bar revolves automatically. Will cut from hardest granite to dirt, and excels in quick sand. We carry drill supplies in stock. **WRITE FOR PRICES.**

**Fort Smith Well Drill Mfg. Co.,**  
**FORT SMITH, ARK.**

## SCHAU TIRE SETTER



"THE MACHINE THAT  
DOES IT RIGHT."

3,000  
in use  
in the  
United  
States  
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Canada

*Write for Catalogue.*

**BURTT MFG. CO.**  
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Is the ENORMOUS AMOUNT OF BUSINESS  
placed with

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CHICAGO, ILL.,

During the Year 1905.

It is also an Undeniable Evidence of

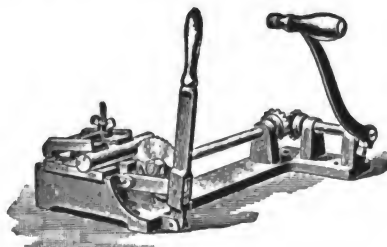
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at the  
**RIGHT PRICES.**

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JUST OUT

Presents a Large Assortment of Materials.

**A Metal  
Cutting**



**Saw  
FREE**

WITH EACH ORDER AMOUNTING TO \$25.00 OR MORE,

Send your Orders for

**Wagon and Carriage Makers' Materials, Blacksmiths' and  
Horseshoers' Tools and Supplies**

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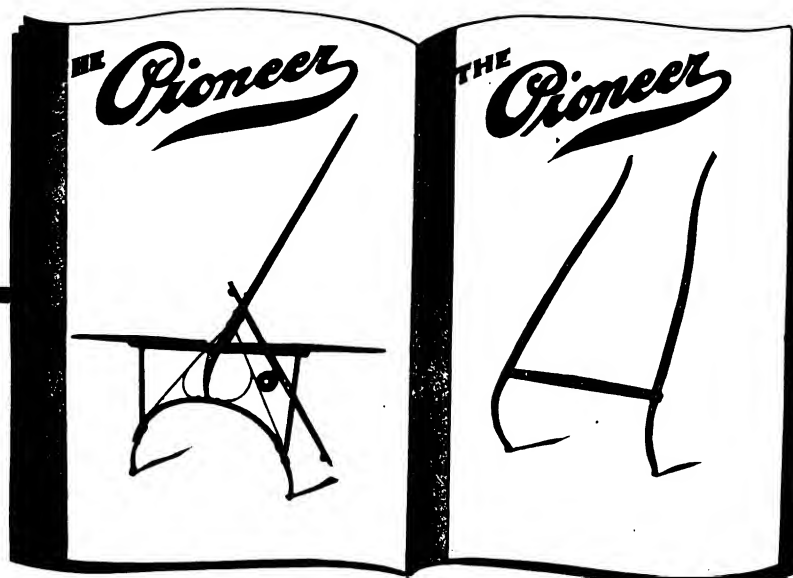
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LAKE STREET BRIDGE,

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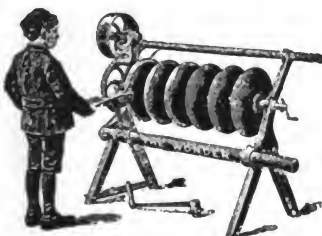
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**W**E would like to have your permission to send you a copy of our Catalogue, showing the different styles, and sizes of poles and shafts manufactured by us.

The PIONEER BRAND has been brought to a standard of excellence in quality and style by the result of years of labor and study of the trade's wants, and is recognized as the peer, as is attested to by the most critical manufacturer, and is demanded by all buyers of vehicles throughout the country. Address all communications to

**The PIONEER POLE & SHAFT CO., Piqua, Ohio.**

# THE WONDER DISC SHARPENERS



THE LITTLE WONDER.

BUY

## THE WONDER DISC SHARPENERS

Why spend your money for an old, out-of-date machine, when you can buy the latest, simplest, neatest, and Best Constructed Machines on the market at the same price?

**WHY BUY THE WONDER? BECAUSE THE WONDERS are the only machines adjustable to all conditions.**

Can shear any part of edge to any bevel.  
Can shear back from edge as far as required.

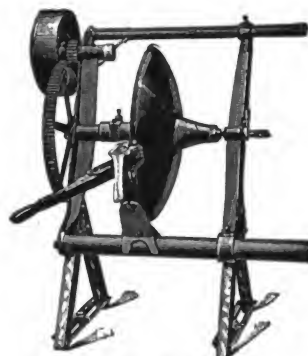
Can use tool on either side of disc.

Can shift from one disc to another.

Can do all this without the turn of a set screw or nut; is a positive feed; automatically adjusts itself to wobbling or bent discs; knives made of best grade, self-tempering steel, will last a life time for hand and power.

**FULLY WARRANTED.** We pay the freight both ways if not as represented.

The LITTLE WONDER will sharpen any size disc up to 22 inches in diameter. The accompanying cut shows the LITTLE WONDER at work on a whole section of discs. This machine is especially adapted for sharpening Disc Harrows and rolling Coulters.



THE GIANT WONDER.

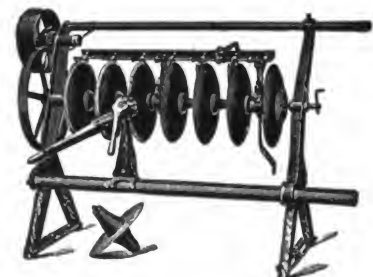
The above cut shows the GIANT WONDER at work on Disc Plows. Will sharpen any size from twelve to thirty-two inches in diameter.

*Write to us direct if your dealer cannot supply you giving us his name and address. Send for circulars. Manufactured by*

**A. E. DURNER, Evansville, Wis.**

*For Sale by Leading Dealers in U. S. and Canada.*

The GIANT WONDER is a larger and heavier machine; has holder attachments for rolling coulters and disc plows; will take in discs up to 32 inches in diameter; is a geared machine and will also take in disc harrow sections same as the Little Wonder and do the work equally as well. The only machine on the market with these advantages.



The above cut shows the GIANT WONDER at work on a Seven Disc section without removing Discs thereby saving one-half the time and labor as in many cases you could sharpen a whole section of Discs while your competitor is taking his off the shaft, the old-fashioned way.

**ASK YOUR DEALER FOR PRICES.**



AUDUBON BOY, 1:59 $\frac{1}{4}$  SHOD WITH CAPEWELL NAILS.

BITHER & PALMER,  
Training Stable.

Readville, Mass., Sept. 25, 1905.

THE CAPEWELL HORSE NAIL CO.,

Hartford, Conn.

Gentlemen:--Audubon Boy, 1:59  $\frac{1}{4}$ , was shod in our blacksmith shop on the morning of September 22, 1905 (when he broke his record and equalled the world's record for mile pacing without wind shield), by our blacksmith, and he used your nails which always give us perfect satisfaction on trotters, pacers, light driving horses,--and on our few draught horses they give the same results.

Yours truly,

BITHER & PALMER.

**"CAPEWELL HORSE NAILS HOLD THE BEST"**

**A nail that will stand the  
test of the Race Course  
will stand anywhere. ✖ ✖**

Made by **The Capewell Horse Nail Company**  
**HARTFORD, CONN.**

The Largest Manufacturers of Horse Shoe Nails in the World.

**BRANCHES**

New York: . . . 103 Beekman St.	Chicago: . . . 238-240 Randolph St.
Philadelphia: . . . 323 Arch St.	St. Louis: . . . 12-14 North 12th St.
Baltimore: . . . 6 East German St.	New Orleans: . . . 736 Union St.
Buffalo: . . . . 11 Ellicott St.	Denver: . . . . 1611 Blake St.
Cincinnati: . . . . 720 Main St.	San Francisco: . . . 636 Mission St.
Detroit: . . . . 29-31 Farrar St.	Portland: . . 554 Worcester Block.
Mexico City: . . . Apartado, 2377	Toronto, Canada: . 50-56 Duke St.

CORRUGATED PATTERN.





## Buffalo Armor Plate Tools.

Built from a Single Plate of Solid Armor Steel.  
Light, Strong, Indestructible,

Armor Plate Steel, with its extraordinary strength and elasticity, is well adapted to meet the sudden heavy and irregular strains as are set up in this class of tools. Cast iron, having small elasticity, requires a great excess of metal to resist such shocks and provide against the dangerous effects of blow holes, shrinkage strains, etc.

With the exception of stand, all parts of these machines are built of Armor Plate, drop forgings and crucible steel. The powerful levers are so compounded as to give the greatest pressure at the proper point of the stroke. All bearing surfaces are machined and carefully fitted. No lost motion. Jaws of shear are of crucible steel, properly tempered, and will not give at the ends or spring. Edges will not break or "chew" under continual use at their respective ratings. Invaluable for cutting stock, roughing out and trimming work, or punching channels, angle or tee bars.

### Buffalo Combined Punch and Shear No. 3 B.

Punches  $\frac{3}{8}$  inch holes in  $\frac{3}{8}$  inch plate. Shears bars  $\frac{3}{8}$  x 3 or  $\frac{3}{4}$  inch round. Height floor to die, 30 inches. Height over all, 46 inches. Weight, 175 lbs.



Armor Plate  
Punch and Shear  
No. 3 B.

*A complete line of Armor Plate Tools of all capacities and suitable for all uses is illustrated in our Special Catalogue. Get a copy.*



### Giant No. 5 Punch and Shear.

A heavy duty machine punching  $\frac{3}{4}$  x  $\frac{1}{2}$ , and shearing 6 inch by  $\frac{5}{8}$  inch.

The Buffalo Portable Punch and Shear No. 5 is especially designed for forge shops, boiler works, structural steel shops, or wherever a portable punch and shear with the capacity of a power-driven machine is desirable. No. 5 will shear 6-inch angle iron in two cuts.

Buffalo Armor Plate tools are always ready for use. They operate quietly and easily, are unbreakable, and can be readily shifted to any part of the shop.

CANADIAN BUFFALO FORGE CO., Ltd., Montreal.

*Buffalo Forge Company*  
*Buffalo, N.Y.*



A low wagon at a low price. Handy for the farmer. Will carry a load anywhere a horse can travel.

### Low Down Wagons

soon earn their cost on any farm.

### Steel Wheels

for farm wagons. Straight or staggered spokes. Any size wanted, any width of tire. Hubs to fit any axle. For catalogue and prices, write to

Empire Mfg. Co., Box 95 H Quincy, Ill.



## Pay Day

What Does it Mean  
to YOU?

No matter what your position may be, whether day laborer or office worker, if you are in that discouraged line of men who get the same pittance week after week without prospect of anything better, it is time you appealed to the International Correspondence Schools. For 14 years they have been qualifying dissatisfied workers for better positions and higher salaries.

No matter what your circumstances are, they will qualify YOU for a better position, a higher salary, and a safe future. The way is plain, easy, and sure for earnest men. It puts you under no obligation to find out how we can help you. Simply mark and mail the coupon below. Can you afford to neglect an opportunity for advancement?

### INTERNATIONAL CORRESPONDENCE SCHOOLS

Box 1302, Scranton, Pa.

Please send me your booklet, "1001 Stories of Success," and explain how I can qualify for the position before which I have marked X.

Foreman Blacksmith	Electrician
Foreman Machinist	Architect
Foreman Toolmaker	Structural Engineer
Foreman Patternmaker	Contractor & Builder
Foreman Molder	Foreman Plumber
Mech. Engineer	Civil Engineer
Machine Designer	Surveyor
Mech. Draftsman	Mining Engineer
Stationary Engineer	Bookkeeper
Electrical Engineer	Stenographer
Elec. Lighting Supt.	U.S. Civil Ser. Exams.
Elec. Railway Supt.	Ad. Writer

If the position you wish to gain is not in the list, state what it is here \_\_\_\_\_

Name \_\_\_\_\_

St. & No. \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_



# BOSS

## LEATHER APRONS



Have you tried them?  
They outwear six of the  
ordinary kind.

Send us your name and address and receive a miniature  
APRON FREE.

Our Aprons are made of cow hide, purely bark tanned,  
soft, pliable, strong and durable. You will appreciate  
the superior quality and extreme comfort of

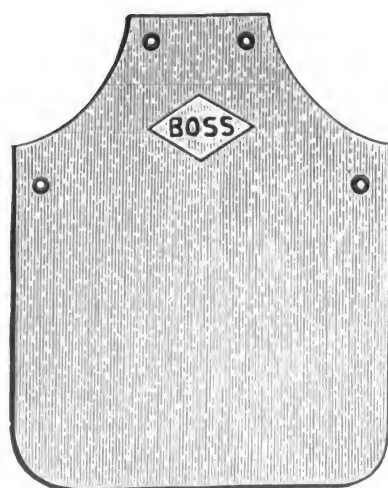
## THE

# BOSS LEATHER APRON

ASK YOUR JOBBER FOR THEM

If he cannot supply you, send your order direct  
to us. Upon receipt of price we will ship a  
perfect "Boss" Apron to you, charges prepaid,  
or will send same by Express, C.O.D. giving you  
the privilege of examining it at Express Office.

If it does not suit you send it back at our expense.



The "Boss" Aprons come complete either  
with or without bib. They have brass  
eyelets and leather straps and every  
possible convenience.

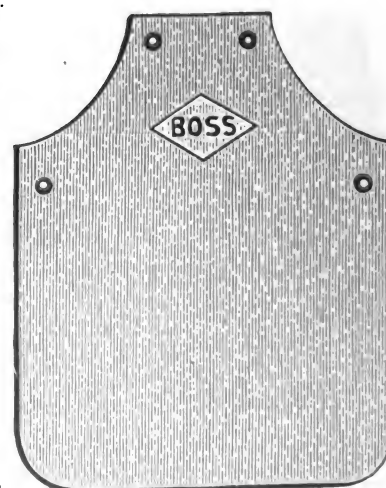
### PRICES.

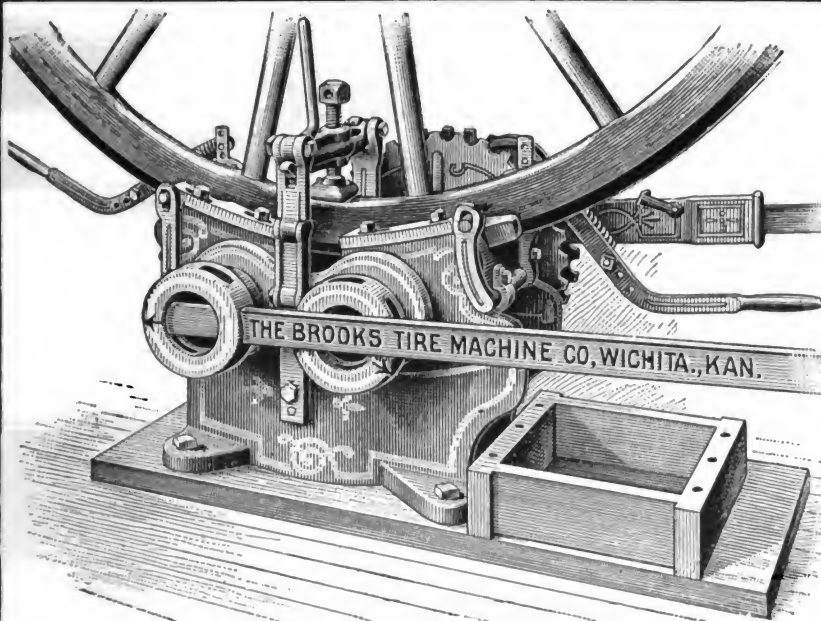
"THE BOSS."		"THE BOSS" with Bib.	
Size X, 30x36 in.,	\$1.50	Size D, 30x42 in.,	1.75
" A, 26x33 in.,	1.25	" E, 28x38 in.,	1.50
" B, 24x30 in.,	1.10	Size F, 26x34 in.,	1.25
" B, 24x27 in.,	.85		

Write to us today and we will send you a miniature  
Apron showing the material used and how they are made.

## EDMUND C. BECKMAN,

SOLE MANUFACTURER,  
712 N. Fourth St., ST. LOUIS, MO.





# The Brooks

**The Only Machine that has stood the Government Tests**

and is known to be the best. It is the greatest business getter and money maker ever placed in a shop.

**A Machine for up-setting tires cold while on the wheels**

It is unnecessary to remove the bolts to upset a tire. It does its work in the most accurate and rapid way. It is durable and simple in construction, and sets all sizes of tires up to four inches. Its high reputation was long established before any other edge grip cold tire setter, now on the market, was built.

Its great success interested Government officers and the Departments investigated cold tire setting as done by the different machines. **The Brooks** was found to be the best and was adopted, and is

**The Only Edge Grip Cold Tire Setter used in the U. S. Government Shops today.** Can you ask for better proof as to the superiority of the Brooks over all others?

All the essential parts required to make the most successful machine, are covered by our patents. To use our construction means to infringe. It is the only machine that has a key adjusting device which prevents the keys from slipping on the tire. With all other makes a hammer and punch or a wrench has to be used to accomplish this, which is very unsatisfactory to the user.

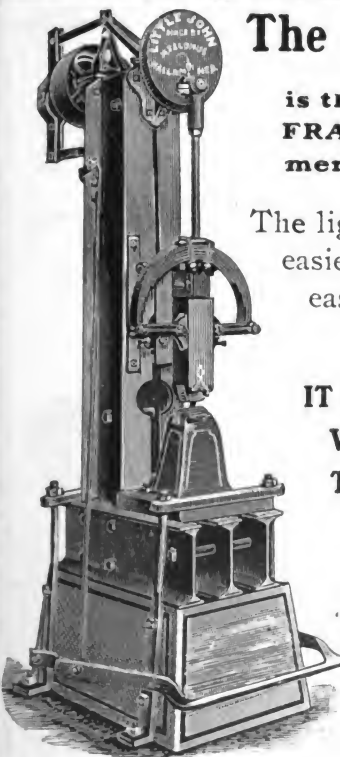
**REMEMBER** time and experience must precede perfection. The Brooks is manufactured by the longest established and most experienced builders of edge grip cold tire setters in the United States.

**It is Shipped on Trial, fully Warranted, and sold on easy payments.**

Think it over and send us your address. We want to tell you more about it.

**THE BROOKS TIRE MACHINE COMPANY,**

121 North Wichita Street.  
WICHITA, KANSAS, U. S. A.



## The "Little John"

is the only **STEEL FRAME** power hammer on the Market,

The lightest, most durable, easiest controlled and easiest running hammer made.

**IT WILL DO A GREATER VARIETY OF WORK THAN ANY OTHER HAMMER.**

"I have operated four hammers, the Minneapolis, Hawkeye, The Little Giant, and yours, and I think that yours runs the best of them all."

ANDREW SCHAUPPNER  
Belden, Nebr

For description and prices, address

**The Lincoln Mfg. & Development Co.**  
LINCOLN, NEBR.

## THE Little Giant

COMBINED

**Punch and Shear.**

**The Most Powerful Lever Punch and Shear Made.**

5 Punches and Dies with Each Machine.

MADE IN THREE SIZES.

No. 1—Will punch  $\frac{5}{8}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{5}{8}$ -inch thick and 1-inch round. Weight, 515 lbs.

No. 2—Will punch  $\frac{1}{2}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{1}{2}$ -inch thick and  $\frac{7}{8}$ -inch round. Weight, 350 lbs.

No. 3—Will punch  $\frac{3}{4}$ -inch hole in  $\frac{3}{4}$ -inch iron. Cuts iron  $\frac{3}{4}$ -inch thick and  $\frac{3}{4}$ -inch round. Weight, 280 lbs.

Only ONE operation of the Lever does the work. No changing required.

Note the improved Stripper and Hold-down. This machine is made for the blacksmith shop, and we do claim that it is decidedly the best on the market for that place.

For Sale by your Jobber. If not, Write Us. Send for Circular.

**Little Giant Punch & Shear Co., Sparta, Ill.**

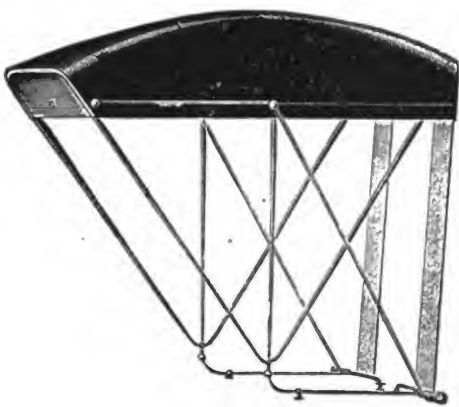


# Carriage Trimmings

Do you need a top, cushion, or back for the job you are building or repairing? If so, write and tell us your wants and we will make you a price. We have one of the most complete trimming shops in the country. We make a specialty of building work to order and can fill orders promptly.

We use nothing but the best material in our high grade work, and the very best cheap material in our cheap work. Below are two pages from our trimming list.

The complete catalogue will be mailed upon application.



## BUGGY TOPS

**No. 0, without Rail, each, - \$5.00**

**Add for Shifting Rail, - - - .50**

**CASH WITH ORDER.**

This will buy our No. 0 cheap buggy top. It is made of black enameled drill, Green or blue cotton head lining. Back and side curtains, colored back, enameled drill. This price includes top complete, with our No. 2 adjustable clip rail, as shown in cut. In ordering tops, always state which is wanted, 3 or 4-bow; otherwise we will send 3-bow.

## BISCUIT TOP CUSHIONS AND BACKS

No.	Cushion.	Back.
39	Fancy enameled drill, green, buff or wine, stuffed with excelsior.....	\$1 25
40	Corduroy, brown, drab, green or blue, stuffed with excelsior .....	1 75
41	Corduroy, brown, drab, green or blue .....	1 90
43	Cloth, 12-oz. union.....	1 75
44	Cloth, 12-oz. all wool.....	2 25
45	Whip cord, medium grade .....	2 50
46	Whip cord, best grade .....	3 25
47	Cloth, 14-oz. union.....	2 15
48	Cloth, 14-oz. all wool.....	2 75
49	Cloth, 16-oz all wool, all hair stuffed, top with extra fine hair.....	3 00
50	Moroccoline artificial leather, green, buff or wine.....	2 00
52	M. B. leather, green, buff, wine or black.....	3 25
53	M. B. leather, green, buff, wine or black, stuffed with hair and excels'r	3 50
54	M. B. leather, No. 1, green, buff, wine or black, all hair stuffed, top extra fine hair.....	3 75

Wing ends on Cushions, 35c. extra. Springs in Cushions or Backs, 30c. extra. Give measure for Cushions inside of seat. The above prices include wood and irons. If no wood or irons are wanted, deduct 25c.



These prices are for cushions not to exceed 28 inches long and backs not to exceed 31 inches long. Larger sizes will be charged for in proportion.

Style No. 1.

**MUNCIE WHEEL & JOBBING CO.,**  
MUNCIE, INDIANA.



**AIR CUSHION RUBBER HORSE SHOE PADS**

NO LAMENESS  
PERFECT SAFETY  
DRIVING OVER ANY  
STREET PAVEMENT  
WITH  
NO SLIPPING

AS EASY TO  
THE HORSE AS  
A MEADOW  
PASTURE

PROLONGS  
YOUR  
HORSES  
USEFULNESS

WILL IN-  
CREASE YOUR  
HORSES  
ACTION.

THE MOST  
HUMANE  
INVENTION  
OF THE AGE

ORDER  
BY  
"NAME"  
AIR CUSHION PADS

TAKE  
NO  
SUBSTITUTE

**REVERE RUBBER CO.**  
SOLE MANUFACTURERS BOSTON, MASS.

BRANCHES  
NEW YORK  
PITTSBURG  
CHICAGO

**JANUARY--1906**

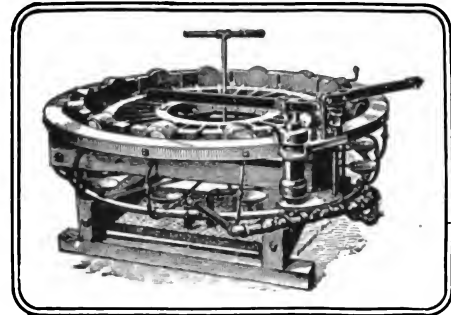
SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

BRANCHES  
MINNEAPOLIS  
NEW ORLEANS  
SAN FRANCISCO

This Calendar, printed in colors on a card 16 x 22 inches, will be mailed free to anyone who will send his address to

**REVERE RUBBER CO.,**  
BOSTON, - MASS.

## The West Hydraulic Tire Setter



Is a **Round Machine** for tiring **Round Wheels**, and compresses the tire at all points—not all in one spot—and the compression is so slight at any particular point that tire bolts do not have to be removed when resetting an old tire, neither are holes closed so bolts are tight in tire. Wheel is made compact and joints tight.

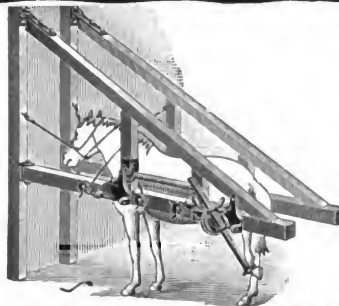
WRITE US YOUR REQUIREMENTS.

## The West Tire Setter Company

ROCHESTER, N. Y.

## BARCUS

Known for their Superior Qualities  
and Advantages over all others



## STOCKS

Every objectionable feature of  
the cheap stock eliminated.

### FILL EVERY SHOP REQUIREMENT.

They are simple, strong and solid, safe and sure to hold, have no ropes and pulleys to tangle and break, no bracing to roof or floor, can be quickly and easily adjusted to any position convenient to the shoer. More Barcus Stocks are used in the up-to-date shops throughout the country than any other horse stock on the market. Barcus Stocks are perfectly reliable and are fully guaranteed. True, they are not the CHEAPEST, but they are the BEST. You run no risk of being injured if you use Barcus Stocks to hold the vicious horse or mule.

Barcus Stocks are furnished complete with hinges ready to bolt to the stationary posts in your shop.

ALWAYS GIVE SATISFACTION.

ADRIAN, Mich, Sept. 28, 1904.  
MR. GEO. BARCUS, Wabash, Ind.  
DEAR SIR:—I have used your Horse Stocks now for three months. Shod about 15 of the worst bronchos I ever saw, with perfect success.  
Yours,  
G. F. BALL.

ASHLAND, Ill., May 14, 1905.  
MR. GEO. BARCUS, Wabash, Ind.  
I wish to say that the horse rack we bought of you gives perfect satisfaction in every respect.  
Yours respectfully,  
HODGINS & DOUGLASS.

EVERY ONE GUARANTEED.

Our complete catalogue will be sent to you free upon request. It tells all about our well known stocks and will interest you. WRITE TODAY.

## GEO. BARCUS & CO., Wabash, Ind. P. O. Box 61.

### The Barcus Toe-Calk Machine

Has a record of five toes per minute, and this machine installed in your shop will save you in cash at the rate of \$6 per day when in use.

Write for Particulars.



A Money  
Maker

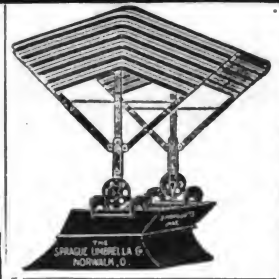
A Money  
Saver



## What COL. SPRAGUE Makes.

Wagon Umbrellas,  
3-Bow Tops,  
Carriage Canopies,  
Auto Tops, Lawn Canopies,

**MADE THE SPRAGUE WAY.**



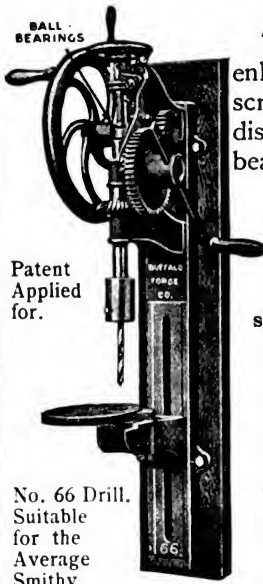
Send for Catalogues.

THE SPRAGUE UMBRELLA CO., Norwalk, Ohio.

## BUFFALO BALL BEARING DRILLS

WITH PATENT BUFFALO SPINDLE-HEAD BALL BEARINGS  
PUT AT THE POINT WHERE THE GREATEST  
WEAR AND FRICTION COME.

THEY run with *one half the effort required with any drill of like capacity.* They will do work *beyond the power of any other hand drill.* They will *outwear any drill on the market.* No Friction. No wear. No back lash or lost motion. No brass connection nuts or soft metal bearings to be renewed.



No. 66 Drill.  
Suitable  
for the  
Average  
Smithy.

This cut shows the enlarged end of feed screw with ball case, disconnecting key and bearings.



Here is the greatest difference in speed.  
Here is the heaviest pressure.  
Here are the ball bearings.

### A Lever Feed with Three Distinct Features.

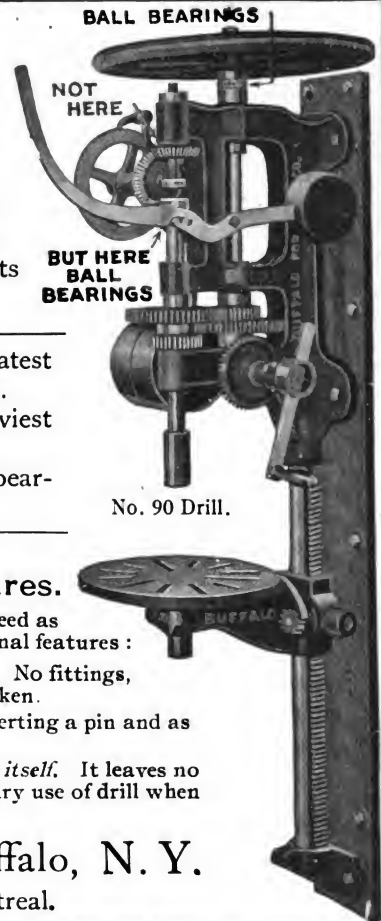
Buffalo No. 90 Ball Bearing Drills are equipped with Lever Feed as shown in Cut. It has the following Three Distinct and Original features:

- FIRST** It is made from a *single piece of heavy forged steel.* No fittings, light castings or projecting parts to be bent or broken.
- SECOND** It can be *instantly snapped in position* by inserting a pin and as quickly removed.
- THIRD** It is *entirely separate* from drill and *complete in itself.* It leaves no projections or fixtures to interfere with the ordinary use of drill when removed.

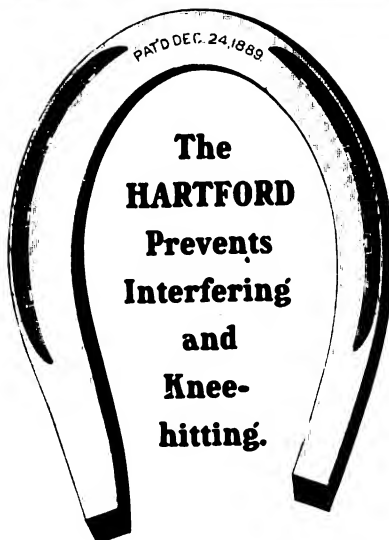
Send for circular.

**BUFFALO FORGE CO., Buffalo, N. Y.**

Canadian Buffalo Forge Co., Ltd., Montreal.



No. 90 Drill.



PAT'D DEC. 24, 1889

**The  
HARTFORD  
Prevents  
Interfering  
and  
Knee-  
hitting.**

## Do You Use the Best Side Weight And Toe Weight Shoes

Made in this Country?

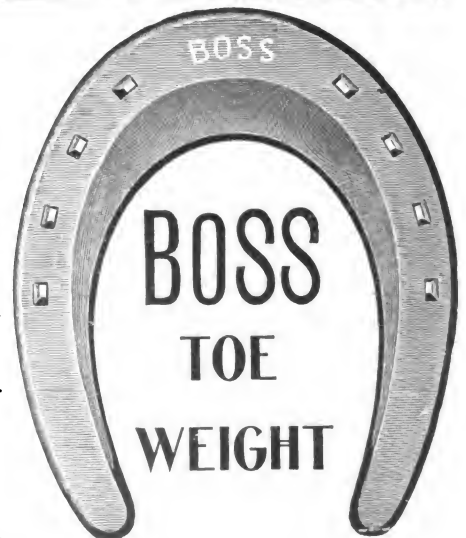
### BOSS AND HARTFORD SHOES

have the highest reputation among the trade. Cost same as inferior makes, mean less labor. Are far superior to a hand made shoe. Carried by all Leading Jobbers.

SEND FOR CIRCULARS.

Sample pair of either size or weight mailed post paid on receipt of 50 cents.

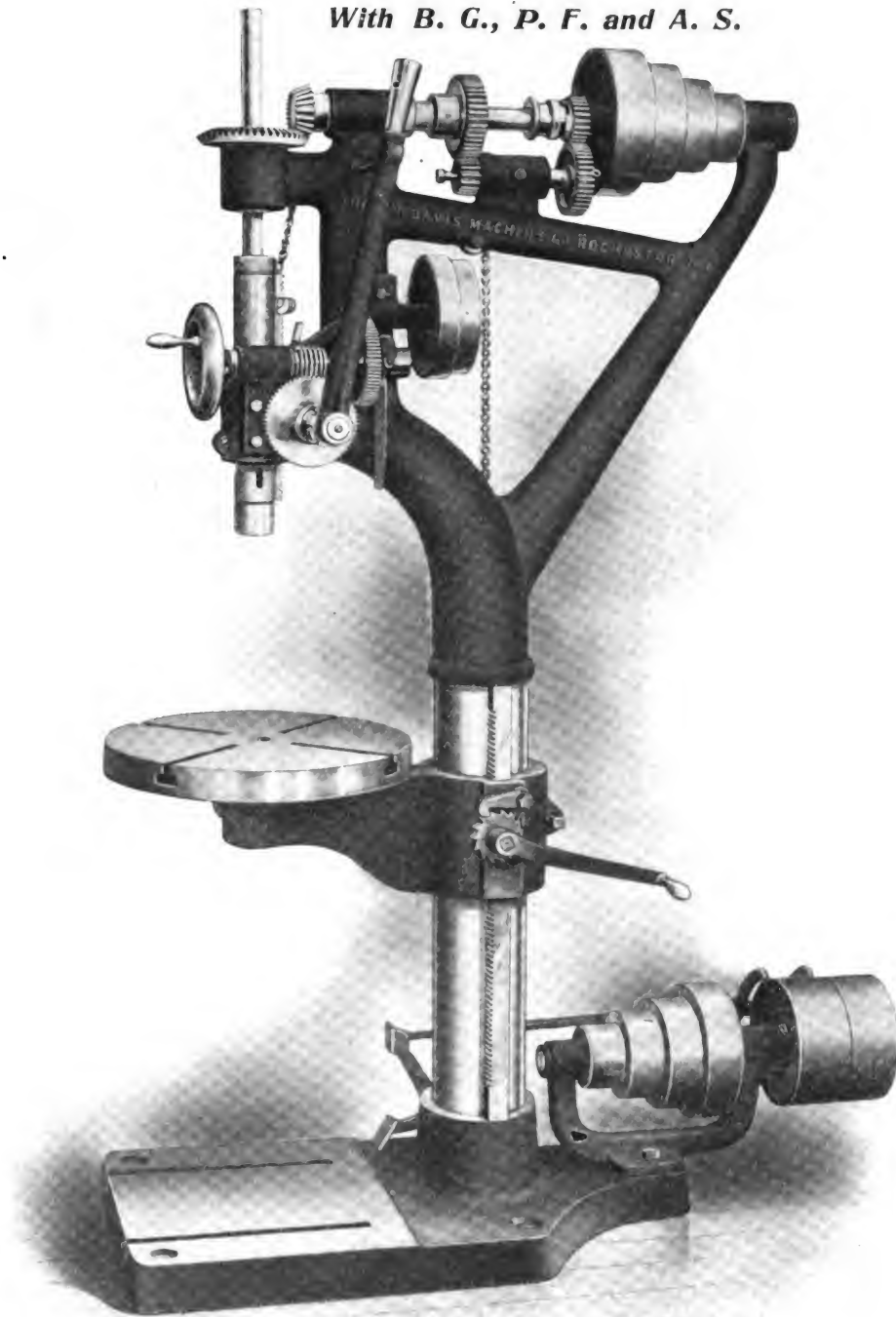
**THE SIDE-WEIGHT  
HORSE SHOE COMPANY,  
Mechanic St., HARTFORD, CONN.**



BOSS  
TOE  
WEIGHT

# ***Davis 20-inch Drill***

*With B. G., P. F. and A. S.*



*Arranged with short base and special arm for drilling tires on the wheels when desired.*

This drill is being used by the U. S. Government, railroad companies and large manufacturing plants which is a guarantee of its excellence; and can be ordered direct or through representative dealers in all large cities in the United States and Europe.

Price, **\$75.00**, net cash, f. o. b. Rochester, N. Y.

*Arranged for tapping and thread cutting \$10.00 additional.*

***The W. P. Davis Machine Co.,*** **ROCHESTER, N. Y.**  
**U. S. A.**

## CHEMICALLY WELDING AT A LOW HEAT

*Saving 33% in time and fuel  
Making the most difficult  
welds easily and securely by  
use of the*

### LAFFITTE WELDING PLATES

This statement is borne out by thousands of enthusiastic users from the country blacksmith to the largest railroads.

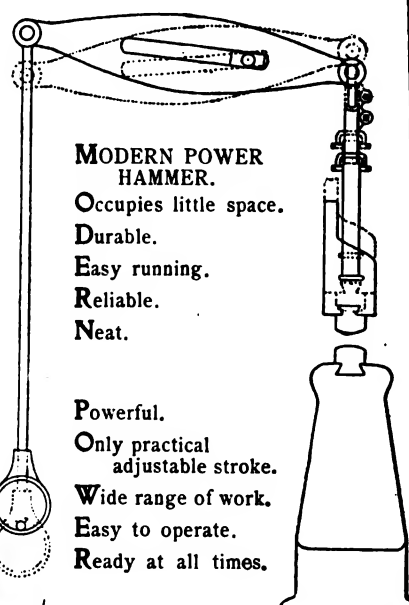
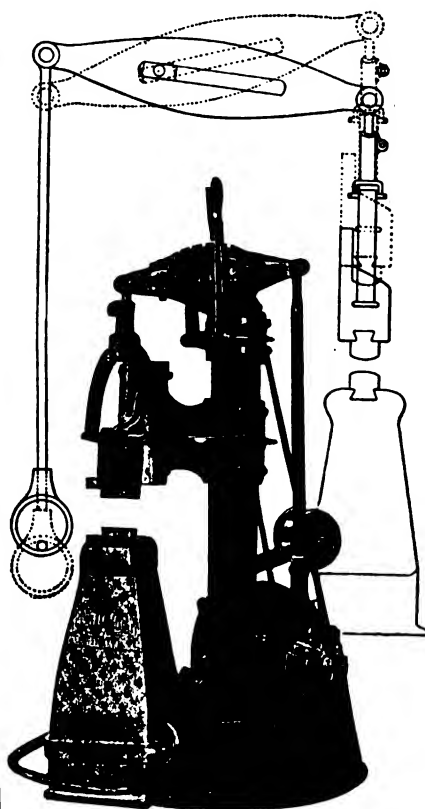
You can weld anything from light spring steel to a locomotive frame—from a broken flatter to a cast steel engine bed.

No departure in method or special equipment is necessary.

Upon application we will send sample without charge.

**F. R. PHILLIPS & SONS Co.**

Penna. Building, Philadelphia.  
For Sale by Dealers.



**MODERN POWER  
HAMMER.**  
Occupies little space.  
Durable.  
Easy running.  
Reliable.  
Neat.

Powerful.  
Only practical  
adjustable stroke.  
Wide range of work.  
Easy to operate.  
Ready at all times.

Heavy or light blow.  
At any speed.  
Makes smithing easy.  
Many in use.  
Every shop should  
have one.  
Reasonable in price.

**GRINNELL MFG. CO., GRINNELL, IOWA.**

## GREEN RIVER DRILLS

AA (No. 734).

### LAST A LIFE-TIME

They cost but a little more  
than the cheap article.

The "GREEN RIVER" Drill is  
built for wear and long service.

Fully Guaranteed.

Write for New Catalogue No. 33  
and see full description.

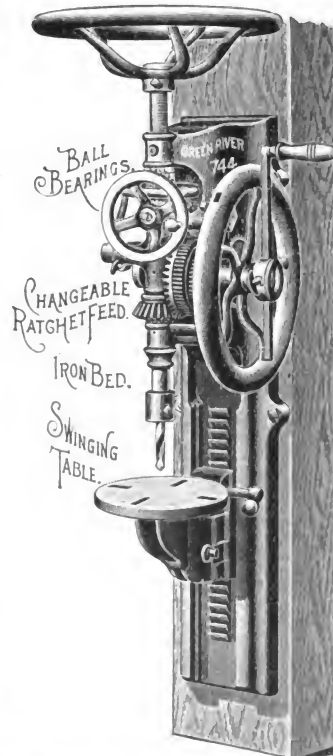
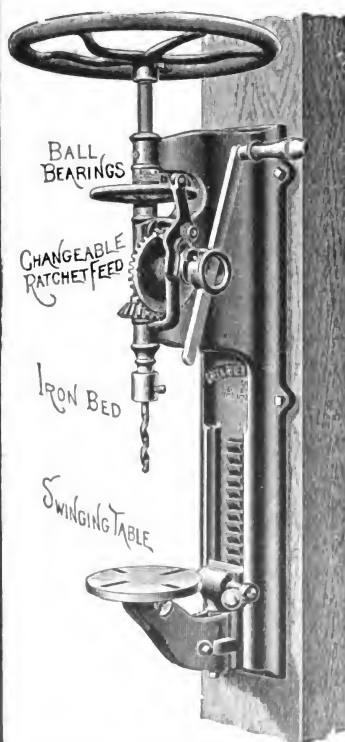
MADE BY

**WILEY & RUSSELL MFG. CO.,**

**Greenfield, Mass., U. S. A.**

Also Screw Plates, Taps, Dies, Bolt Cutters  
and Shoeing Vises.

No. 744.







**MR. SHOP OWNER:**

This is the hammer you should have on hand as a part of your shop equipment, because she is good at any season of the year,

**KERRIHARD POWER HAMMER**

**BUILT RIGHT. RUNS RIGHT. IS RIGHT.**

Designed for the blacksmith shop and built to stand the work. Made after correct lines and embodies correct mechanical principles.

**GET  
CIRCULARS  
AND  
PRICES.**

**1905 Emery Grinder.**

Built for shop work, easy and true running, will last a life time. Been on Market for 15 years. Will take Wheels with 1 1/4-in. hole, 20-in. dia. and 3 in. thick.

**SPECIAL ARBORS  
CAN BE  
FURNISHED EXTRA.**



**Thousands in use  
Get our prices**

**The Kerrihard Company**

**GENERAL FOUNDERS, RED OAK, IA., U. S. A.**

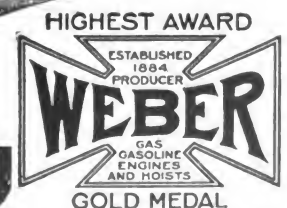
**THE ENGINE YOU WANT**

Crank Shafts, Forged Steel,  
Connecting Rod, Steel Billet,  
Heavy Fly Wheels,  
Heavy Piston,  
All Parts well  
Made by High  
Grade Me-  
chanics.

All this means  
less cost to run  
than any other  
engine, for there  
will be less Fuel  
used.

**Write us for  
Catalogue.**

**WEBER GAS and GASOLINE ENGINE CO.,**  
Box V 1114, KANSAS CITY, MO.

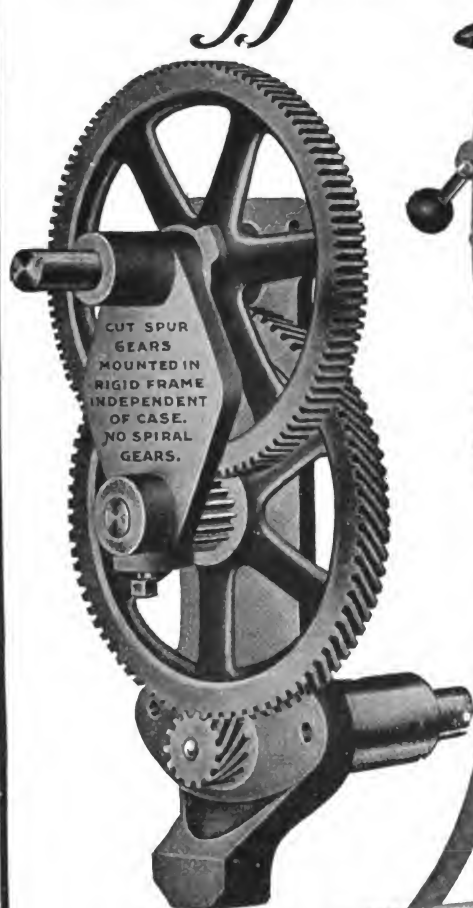


# Buffalo 200 Blower

"PRIDE OF TODAY'S SMITHY"

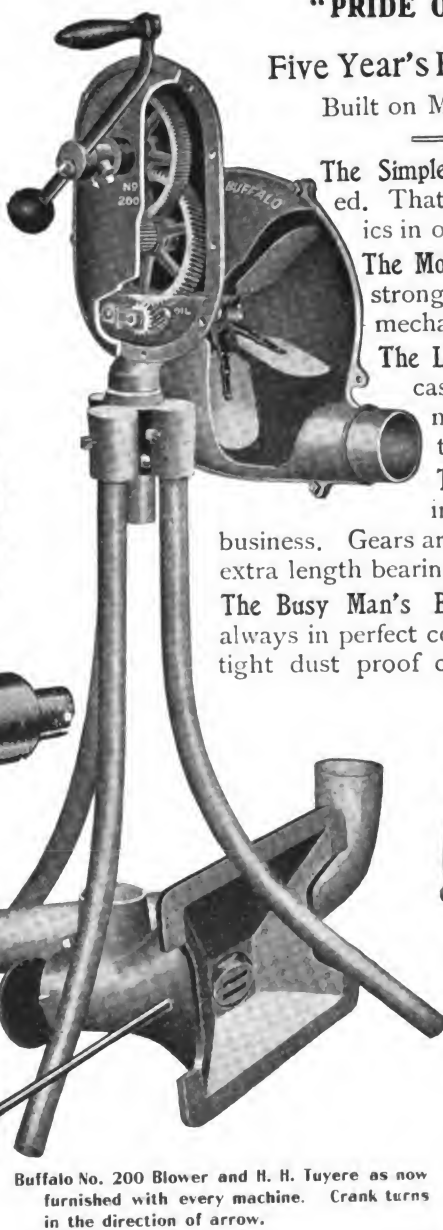
Five Year's Protection against Repairs.

Built on Modern Mechanical Principles.



Gearing Used on Buffalo Nos. 200 and 201 Blowers.

Canadian friends:  
Save duty, buy of  
The Canadian  
Buffalo Forge  
Company,  
Montreal, Quebec.



Buffalo No. 200 Blower and H. H. Tuyere as now furnished with every machine. Crank turns in the direction of arrow.

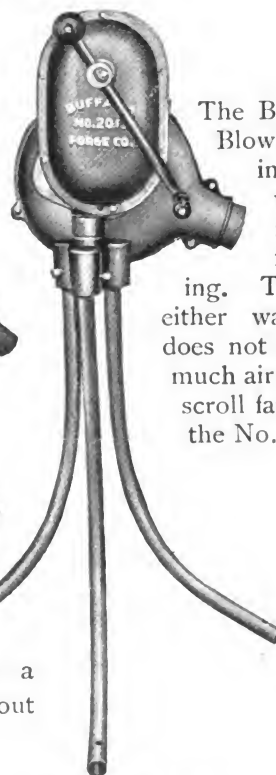
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The Most Durable Blower—look at the gears, strong, large and heavy. No watch-case mechanism can stand a five year guarantee.

The Lightest Running Blower—our scroll fan case is the correct scientific one and gives more air per revolution with less power than any other form.

The Sturdiest Blower—no racking twisting or battering strain can put it out of business. Gears are held in a cast iron box frame with extra length bearings.

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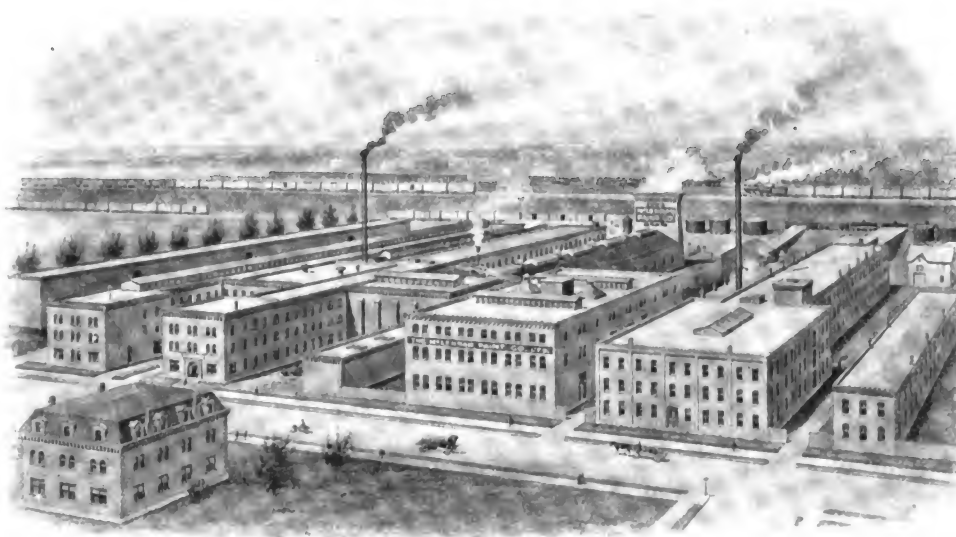
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BUFFALO, N. Y.

Buffalo No. 201 Blower furnished with H. H. Tuyere.



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AND WAGON  
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**BUFFALO, - N. Y.**

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Guaranteed to Give Perfect Satisfaction.

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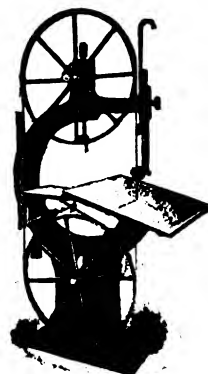
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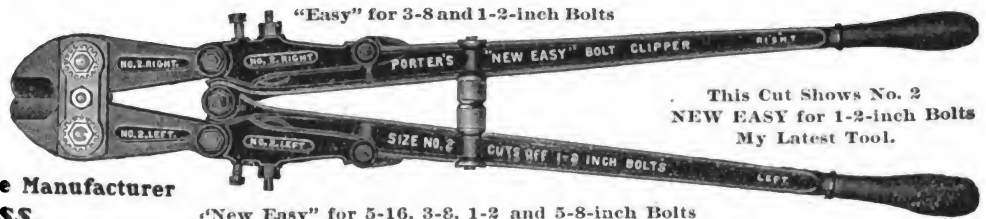
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**H. K. PORTER, Sole Manufacturer**  
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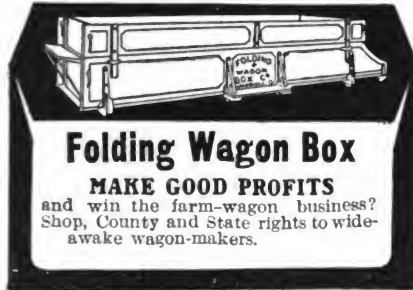
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INDIANA TOP & VEHICLE CO.  
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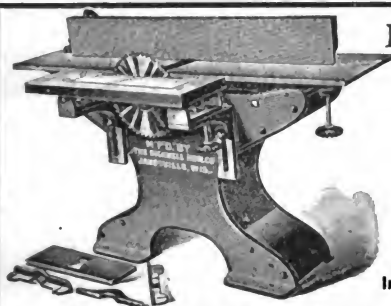
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*Made in All Sizes and Patterns*

**And the BEST SHOES on the Market.**

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That's what horses do  
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## HOOF PADS

They make travel more comfortable for "man's best friend" and greatly lengthen his life of usefulness.

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NEW YORK

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All dies are adjustable and reversible for hand or machine use. This feature alone

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The  
**Snow King**

Leather Back, Cushion or Suction Cup. Built like a fly's foot. Keeps horse from slipping on asphalt or icy pavements.

**THE NIAGARA**

White Rubber  
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THE  
**EASY**



Extra Heavy Leather Back—Has the rubber where it is needed.

Prevent strains, corns, and other foot troubles.

**THE GOODYEAR TIRE & RUBBER CO., AKRON, OHIO.**

Branches at Boston, Chicago, Denver, New York, San Francisco and Los Angeles.

# THE AMERICAN BLACKSMITH

A Practical Journal of Blacksmithing and Wagonmaking

VOLUME 5

FEBRUARY, 1906

NUMBER 5

BUFFALO, N. Y., U. S. A.

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## Practical Experience and Books.

A combination of the two will make a most efficient and valuable craftsman. Either alone puts a limit on his capacity. The value of practical experience is not to be questioned, but add to it the information to be gained from good practical craft books and you have the making of a leader in craft work.

The value of any book depends, of course, upon its author—the man behind it. If he has not had years of experience in his subject, if he has not carefully studied each branch of it, the book is practically worthless. A book to be of value must be the result of years of experience and observation on the part of the author. He must talk in a plain understandable way. When we consider the number of books in which authorities offer the fruits of their life work, it becomes unnecessary to purchase any but reliable volumes. The past year has seen numerous books published on blacksmithing subjects, and it is a pleasure to note the increasing demand for publications in this line.

Every smith, no matter how experienced, can always find a book, on his branch of the craft, which it will profit

him to read. Or perhaps, there is some branch of the craft which is more or less a puzzle to him. Here again does the practical craft book find a place. The practical smith will do well to make up a list of good craft books and then get them at his leisure. And readers should at all times feel at liberty to consult us regarding any books which they may desire. We are constantly in touch with the leading publishers and always have on file catalogues of the latest publications in our field.

## The Blacksmith and The Credit Question.

Few smiths, especially those in rural districts, can answer "No" to the credit question and make a success of their business. The average farmer cannot pay cash for his work, and therefore, the smith desiring his trade must give him credit. But, when giving credit, it is by no means necessary to allow the account to run until the debtor has forgotten about it. Insist upon payment at the set time. If credit is extended for thirty days, require payment at the end of thirty days and don't allow the account to run for two or three months. Prompt collections mean discounting your own bills, and this means profit before goods are sold.

Probably the best system of credit regulation is that in connection with a good, strong organization. It is generally conducted as follows: All members of the organization agree to refuse credit to customers who owe bad debts to any members of the organization. A list of the debtors is distributed every two weeks and all members are compelled, by agreement, to furnish reliable information relative to any customer's standing and responsibility. All breaches of any agreement are liable to a fine, and three fines are considered a dismissal from the organization.

This system works very successfully in many branches of business and there is no reason why any community of smiths cannot protect themselves in just this way. There are, of course, minor details to this plan, but the outline will

give an idea of its working principles.

Of course, should the smith not have the advantages of an organization, he will necessarily install his own credit system. This may be more or less elaborate, according to the amount of business done. Among other things, the smith should insist upon references from a stranger wishing to open an account and follow-up the references when received. He should keep his eyes and ears open at all times, as many things are heard in a casual way, that, if taken advantage of, would perhaps save him many dollars. He should make it a rule to request payment at the specified time and let his customers know that the rule must be followed.

No business can hope to succeed with a loose system of credits. Prompt collections are necessary if the smith is to pay his helpers, discount his bills and succeed. It is a duty the smith owes family and self. It is hardly fair that your debtors live in comfort on your money, while yourself and family are doing without necessities. But that is what long credits amount to, and until the smith makes a heroic attempt for betterment, they will continue so. Insist upon prompt payments and then discount your bills. It's profitable and "easy lies the head with no debtors."

## The Story of Iron Ore.—2.

This shipment consisted of six barrels and was consigned to B. L. Webb, Detroit, who was at that time secretary of the Jackson Iron Company. The ore was shipped to Sault Ste. Marie on the steamer Baltimore. Prior to this time it was reported that some five tons had gone forward to A. L. Crawford, at Newcastle, Pa. In the fall of 1853 about 150 tons of iron ore was sent forward by the Cleveland Iron Mining Company to the furnaces of the Jackson Iron Company at Sharon, where it was tested in the blast furnace. It made a superior grade of iron, but it is doubtful if it was smelted successfully so far as the blast furnace was concerned, as it left the furnace in very bad shape. However, its quality was undoubted, and

the iron companies determined to convert the plank road into a strap railroad. Meanwhile construction had begun on the canal at Sault Ste. Marie. Energies were bent to complete the strap railroad before the canal should be opened, but as the strap railroad was not completed until November, 1855, the canal was actually finished several months before.

railroad led a very strenuous life, indeed, for two years. The motive power was mules, and the cars held about four tons each. The mules could make only one trip a day. The grades were simply frightful, and the cars sometimes ran away, mangling the mules and jumping the track at the first curve. Heman B. Ely had begun the construction of a

was termed in the newspapers of the time "an avalanche of ore."

(To be continued.)

#### A Wall Light and a Copper Vase.

The two examples of artistic metal work shown this month are somewhat out of the ordinary. They are both from the Illinois State Reformatory and show the attention paid to originality in teaching at this institute.

The wrought iron wall light is well executed and while it is, perhaps, a bit stiff in its details, it is altogether a very pretty piece. The copper vase with its brass ornaments shown in the other engraving is exceptionally handsome and would prove an artistic adjunct to any home. The copper and brass produce a most pleasing contrast and the whole piece is most artistically executed.

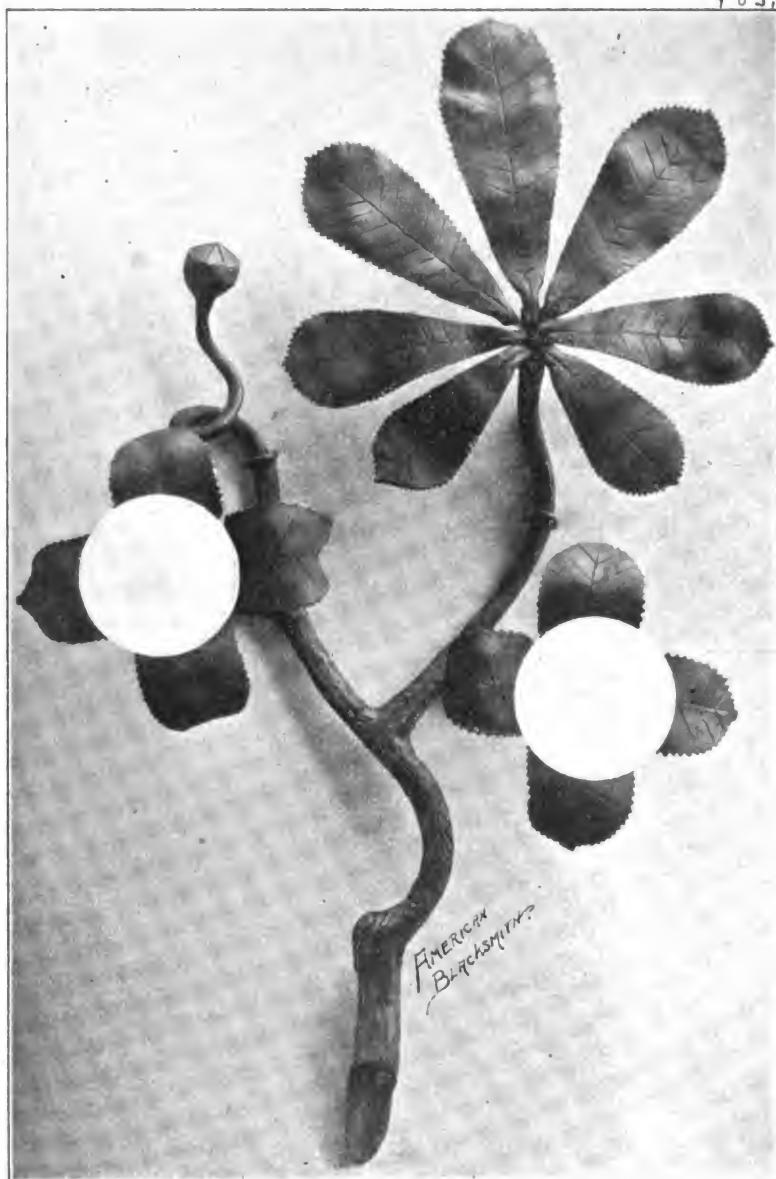
#### The Blacksmith Trade Thirty Years Ago.

A. J. YEAGER.

Some of the old boys will remember what it meant to learn a trade then and what it means now. Thirty years ago when a boy bound himself out to learn the trade he learned it, but now you find one in fifty that has served an apprenticeship. In those days when a man started into business for himself he knew how to do a job, and he knew when he did it right and also how to do it right. You did not hear much talk about different lines of the trade not paying, because, men knew how to make them pay. Men, who stood behind the anvil then, knew what they were there for. And when a customer came in to have a difficult job done, they did not tell him to go to the implement house and buy a new part. They went to work and did the man's job and did it as it should be done.

How different now, I venture to say that seven out of ten blacksmiths that you may find in the west and middle west have not served over six months to learn their trade. They pick it up by experience in their own shops, and what they have taken out of the trade journals. This is what has caused a great many men, who were having their old plows and other farming tools repaired, to buy new ones, saying at the same time, "I would get this repaired if I knew of some one that could do it," referring to some former job that was ruined.

This is the matter with our business to-day. And it is this that has caused men to put their money into large factories which make everything the farmer needs, in duplicate and in large quantities, then selling the articles to the



A SIMPLE BUT PRETTY WALL LIGHT IN WROUGHT IRON.

The first shipment of ore through the canal was on the big Columbia on Aug. 17, 1855, and consisted of 132 tons, shipped by the Cleveland Iron Mining Company, consigned to the Cleveland Iron Mining Company. In point of fact all the ore that left the peninsula that year, 1449 tons, was shipped by the Cleveland Iron Mining Company, the other two companies, the Jackson and the Lake Superior, not being prepared to ship any ore at all. This old strap

steam railroad to the mines, and when Congress passed the act to stimulate the construction of railways, the iron companies made overtures to consolidate their strap railroad interests with Ely's steam railroad interests, in September, 1857, and the first two locomotives used upon it were named "Sebastopol" and "C. Donkesley." These two locomotives were the first to be used in the peninsula. These locomotives were capable of hauling 1200 tons a day, which



catalogue houses, and they in turn to the farmers and sometimes to the merchants and mechanics in other lines for less money, freight added, than we can buy the raw material for.

I have seen men run a buggy with the tires so loose on the wheels that you could see under them all the way around the wheel. When asked why they did not have them set, the reply invariably is, "I am afraid to have it done because the blacksmith will spoil the wheels by dishing them too much." Where is there a blacksmith who has learned his trade and cannot set a buggy tire without spoiling the wheel?

Here is another little thing that it has been my good fortune to know how to do. It is nothing more than welding a new shank on a common pitch fork. In the first place, I will tell you how most smiths do it. They take a piece of steel, wrap it around the fork where the shank is broken off, and then they weld it together and try to make a good job of it. My way is to draw the stub, if any, to a chisel point, take a piece of steel a trifle longer than the size you want the shank to be when finished and split it back far enough to lap well up on the stub. Now, take a nice heat, applying plenty of welding compound, and when ready to weld, put it across the corner of the anvil. Hit once or twice endways and then weld it down at top and bottom. Now draw it to the size you want it, and you have a neat, good job which will please your customer, and is as good as new. This is a small job, but very difficult for some to do.

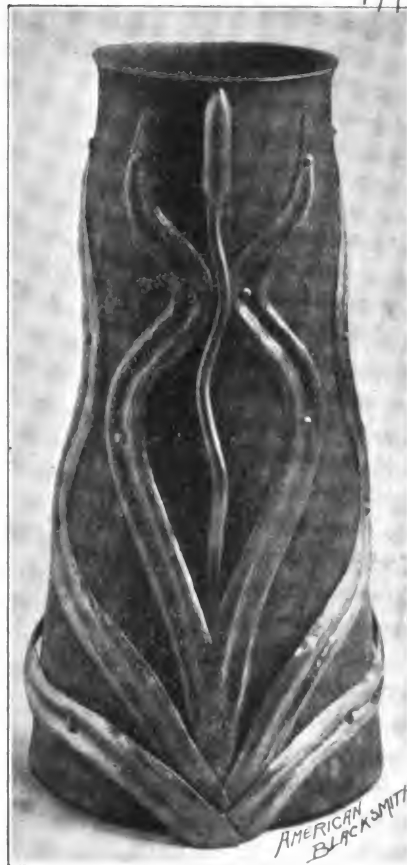
#### Does the Paint Shop Pay.

J. L. LARUE.

In answer to the above question, I say, yes, if conducted on scientific principles. I have repainted 18 buggies this season at \$5.50 each, amounting to \$99.00. The cost of the material used, consisting of paint, varnish, rubbing brick, pumice stone, sand paper etc., including cleaning, was about \$27.00, which leaves \$72.00 for labor and profit. And as the labor could be done for about \$36.00, the other \$36.00 you could figure as a profit.

My schedule for doing the work is as follows: I first clean up the job after unmounting and sand down and touch up bare spots. When dry, I flow on a coat of Sherwin-Williams perfect-method gear-filler for gear. Let this stand 24 hours, then flow on a coat of good strong color and let stand another 24 hours, when it may be striped. When this is dry, flow on a coat of good gear finishing varnish for the body. Then

sand down and flow on from 2 to 3 coats of body filler. When dry, rub out with rubbing brick and water. Next flow on a good strong coat of black rubbing varnish and let stand 48 hours. Then rub out with fine pumice stone and water. When dry, flow on a coat of finishing varnish and you will have a job good enough for anyone at the price of \$5.50 and you will still be making a profit. I never paint an old worn out buggy. You cannot make it look like anything and you would have a dissatisfied customer. Nearly every buggy that comes in for painting needs con-



AN ARTISTIC EFFECT IN COPPER AND BRASS.

siderable other repairs. Possibly, new tires, or tires reset, new rubber in the old channels, new side curtains etc., thus making a double job.

Now, I would like to say a word on side lines, as I think they pay nicely. As side lines, I carry a stock of good finished buggies, wagons, harness, blankets and robes, sleighs and bob sleds, hay tools, carriers, slings, track pulleys, door hangers and nearly all the hardware that a farmer needs. I get fairly good country prices on everything I do or sell. I do a general blacksmithing and wood working business. A few of my prices are as follows:

Horseshoeing, plain, new, No. 4. \$ 1.20  
Up to No. 7, new. . . . . 1.50

Tire setting each. . . . .	.50
New rims and tires on buggy $\frac{3}{4}$ or $\frac{1}{2}$ . . . . .	6.50
Cutting down wagon 3 inch rims and tires 3 by $\frac{3}{4}$ . . . . .	14.00
Rerubbing a set of old channels . . . . .	16.00 to 17.00
Cushion tires . . . . .	24.00
Repainting old buggies. . . . .	5.50
Wagon gears, no box. . . . .	5.50
Wagon gears, complete. . . . .	8.00

#### The Forge Shop at the Ethical Culture School.

ARTHUR M. RICHARDS.  
Director Dept. Mechanics Arts.

The Ethical Culture School of New York City, comprises a complete school system covering all grades from kindergarten to normal school, with the prospect of opening its doors evenings to those whom circumstances or inclination have led out of school and into the industrial ranks all too young. It, of course, endeavored to make adequate provision in its new building, which was finished in January 1904, that its pupils, of all ages, might receive some training in the manual and tool arts. To this end the school contains well housed and equipped departments of fine art, domestic art, domestic science, general science laboratories, and mechanics-arts.

The Mechanical-Arts Department, consists of one bench and wood-turning shop, one lumber and supply room, with machinery, one bench shop, one machine shop, one forge shop, and an office, which provides for class assembly. In equipping these shops the policy was to install first grade tools and machines, highly representative of their kind and large enough to meet the average needs of school work, and not for that extra large and special job that might come up sometime in the future.

The forging equipment of the school is not a great plant, but it is a neat, orderly, well arranged and well lighted plant, which is adapted excellently to the needs of a small high school, for forge work, and for any industrial evening classes which the future is likely to require. The equipment consists of twelve down draft forges with pipe connections for two more, arranged in four rows extending from the window side, one row on each side wall, and two rows in the center placed back to back. Workmen at the side forges face toward the center, and those at the center forges face the sides. Blast and exhaust is supplied through fans driven by a fifteen H. P. motor, placed in the sub-basement under the shop, which is controlled from

the shop floor. The shop contains a shear and punch, and a blacksmith's drill, all the above having been furnished and installed by The Buffalo Forge Company. The anvils are 140 pound Peter Wright, set on 12 inch by 12 inch hard pine blocks.

It may be of interest to know the manner of their setting, at it was necessary to set them on a steel beam, hollow brick, fire proof floor, the top being concrete with a cement surface. A piece of 3 x 3-inch angle iron was lag-screwed on to each side of the block at the lower end. The blocks were then placed in position on the floor before the concreting was begun, and set upon small blocks three inches above the floor

from the machine shop line shaft.

In addition to the main items of equipment for forging and moulding, enumerated above, the shop contains a case of thirty work lockers; a blackboard; a sink for shop use, not for washing; a stock rack; tool kits for each anvil, and a general kit, and the necessary hammers, tongs and other small tools usual to the shop.

In connection with the course in forge work, it should be understood that the students who take forging in this school are high school boys of the city type, and not engineering students of a university. The plan is to have the work of such a nature that it will acquaint the student with the fundamental processes of forg-

such a way as to distribute light well to all anvils. Lights along the wall illuminate the benches. A store room for both coal and sand is under the sidewalk and street.

### Blackboards in Blacksmiths' Shops.

L. VAN DORIN.

Always keep a blackboard in your shop. Smiths are frequently called upon to make or forge something they never saw, and then its a great help to have it sketched so its form may be thoroughly impressed on the mind before starting to work. Otherwise the first effort may land in the scrap pile. But when you make your own draft and thoroughly understand it then your work is about half done.

To my mind there is nothing equal to drafting for developing the mechanical faculties. Hence every young blacksmith should know something about it

A board and chalk cost but little. In building new work I consider a large blackboard indispensable as we are liable to get an order for a job differing from the line of work we are familiar with and it then becomes quite necessary to put the side elevation, at least, on the blackboard, where it can be consulted. And we sometimes find it necessary to change the height of wheels, drop of axle center, opening in the springs, so the job may hang level. and possess a pleasing appearance when hung up or assembled.

The writer has in mind many jobs possessing first class work throughout, but for lack of proper architecture would fail to sell, while an inferior job with more pleasing outlines will sell very readily.

### Forging Blacksmith Shop Tools.

W. P. WOODSIDE.

Of course most tools, such as tongs, fullers and swages, can be bought, but I do not consider them nearly as good as the hand-made tools, providing the smith takes pains in making them. The factory-made fullers, swages and flatters are made from a very soft steel and the head batters down very quickly. They are also about twice as heavy as there is need for. In making fullers, swages, flatters or set hammers make them as light as possible, for in using big heavy tools a considerable force of the blow is lost by the weight of the tool. The easiest way to forge any of the previous mentioned tools is to have a block with a square hole in it (The swage block furnishes this if you have one and if not, get one, as every general blacksmith shop should have one, also a taper



A BUSY CORNER OF THE FORGE ROOM AT THE ETHICAL CULTURE SCHOOL.

beams. The concrete was then run and tamped carefully under the blocks, the filling continued up over the angle irons some three inches, the cement top being then put on and worked close up to the blocks and smoothed off. A line marked around each block while the cement was soft, gave design to the job, which was thoroughly substantial and neat in every respect.

This shop is also used for the foundry work, which is intended to meet the needs of high school students only. The setting up is done on the wall bench mentioned above and shown on the plan. Owing to the severity of the building laws and requirements, a cupola was out of the question, and a No. 7 Crucible gas furnace, made by the American Gas Furnace Company was installed in its place, the pressure blower required being run by power derived

ing, as bending, drawing, upsetting, welding, heating, etc., but at the same time have this practice result in something that is complete in itself, and is of use. The abstract exercise is not considered essential, simply because it is valuable now and then.

So far in our short career, we have found excellent forge practise in making bent and punched straps, bolts, planer stops and wedges, tap wrenches, hammers for sheet metal work, ladles, flask clamps etc., all of which are directly useful in the shops and yet are in themselves little more than exercises. It is purposed to continue the work along these lines, extending it, however, to household and cabinet iron and metal work. The idea being to keep always a natural and vital motive in the work.

Artificial light is furnished by four clusters of electric globes placed in

mandrel with about a 16-inch face). Next select the size of steel required. This should be  $1\frac{1}{2}$ -inch square for some of the tools and  $1\frac{1}{4}$  for the largest sizes. Now to make a flatter of  $1\frac{1}{2}$ -inch square stock jump the end of the bar a little as in A Fig. 1. Next cut piece about 4 $\frac{1}{2}$  inches long and place in the square hole

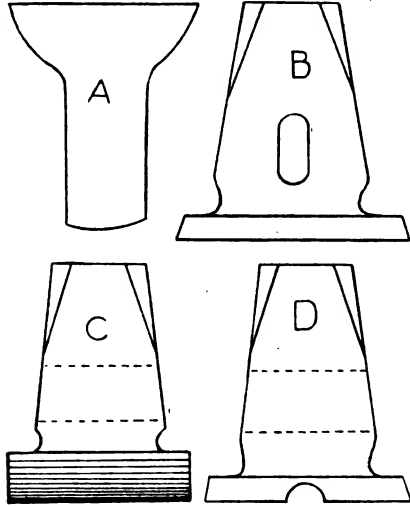


FIG. 1.—THE FACTORY-MADE FLATTERS BATTER DOWN QUICKLY.

of swedge block and flatten out the face. Now square it up upon the anvil and turn up with your hot chisel. Next punch the center of eye about 2 inches from the face, see B Fig. 1. Now draw down the head, tapering it as shown at B and your flatter is done. The same method is used in making swages, only before punching the eye forge the size groove required. In a great many cases, fullers can be made by just flattening the bar and trimming up the face and then driving them into the desired sized groove in the swage block. Then punch the eye. See C and D Fig. 1. In punching the eye for all tools to be hammered upon such as flatters, swages, set hammers and fullers, always have the head part quite a bit the longer for it is this part that receives the greatest amount of wear.

Set hammers can be made by just punching the eye and cutting the tool the desired length as at E Fig. 2. Two other very handy tools are shown at F Fig. 2—top and bottom necking fullers. In making bottom swages always have the swage part come flush with the back edge of the anvil so as to enable you to swage up to a shoulder thicker than your swage. These tools are made by first drawing down the stock to fit the square hole in the anvil, then cutting the stock the desired length, place in square hole and flatten down to required size as at G Fig. 2. Full-

ers are made in nearly the same manner, see H Fig 2. In making large top swages, say from  $1\frac{1}{2}$  inches up, jump the steel a little and then split and slope up with a piece of round stock.

The quality of steel required for the previous tools mentioned is a common grade of tool steel at about 8 or 10 cents per pound in a temper suitable for cold sets. After a tool has been used considerably and the head becomes battered down too much take the tool on the edge of the anvil and knock the burrs off. Never take a heat on the end and flatten it down, for in doing this you open the grain and make it soft again, just undoing what the continual hammering has done. It has made the steel hard and dense and it will take twice as much hammering now to make it burr up as it did at first.

### Carriage, Leather and Rubber Goods.—2.

Methods of Treatment to Insure Preservation.  
M. E. HILLICK.

With the rubber top a different treatment for the most part, is needed. The rubber top upon its first visit to the shop usually requires some sort of a dressing to preserve the enamel and bring about a finish to correspond to that upon the other parts of the carriage. This depends to be sure somewhat upon the weight and quality of the rubber used in the top, but it is safe to say that the average rubber top really needs a dressing of some rubber preservative. And when speaking of the top we include the storm apron, side curtains, and all the rubber fittings about the vehicle. The grained leather or patent leather dash, shaft trimmings etc. require sometimes a mere cleaning up and polishing, first with common kerosene oil, and then with clean, soft cloths. Always wash the rubber top with the same care and thoroughness that is given to leather tops. With a 2 $\frac{1}{2}$ -inch. flat elastic bristle brush of good quality, soft in the stock yet firm in the strength of its bristles, apply the dressing sparingly, except perhaps, in cases where the rubber is much the worse for wear and offers a dry absorbent surface. Moreover, let the material be applied uniformly which implies that the work should be performed by painters who know the value of good brush work and are competent.

There are so many excellent top dressings on the market quoted at a reasonable price that it is no longer necessary for the painter to make the dressing required unless he chooses to do so. Nevertheless, a good many painters prefer to make the top dressing they use

and find it the most satisfactory practice.

There are numerous formulas, possibly some of which have been already published in these columns, but a new field of readers moves constantly into the foreground thus warranting a possible repetition. To make a good serviceable rubber dressing use  $\frac{1}{2}$  gallon of gear finishing varnish, a like quantity of turpentine, 2 ounces of beeswax and sufficient lampblack to give the mixture the proper color. Melt the beeswax and place all the ingredients in a closed can and mix intimately by shaking. This dressing is better if made up a few days in advance of actual needs, the can containing it being in the meantime repeatedly shaken, by which treatment it acquires a smoothness and a working property not otherwise secured. A dressing better adapted to cheap rubber tops which so often come to the shop in a bad condition, with the enamel of the rubber entirely worn off in places, the following formula describes:— $\frac{1}{4}$  gallon boiled linseed oil,  $\frac{1}{8}$  gallon coach japan,  $\frac{1}{2}$  gallon each of liquid asphaltum, gear finishing varnish and turpentine. Place these ingredients, along with  $\frac{1}{2}$  pound of coach black, in a can of requisite size, shake repeatedly for two or three successive days to smooth out and better liquify the mass, and then use as required. Probably a further addition of turpentine will be necessary to thin out the dressing to meet require-

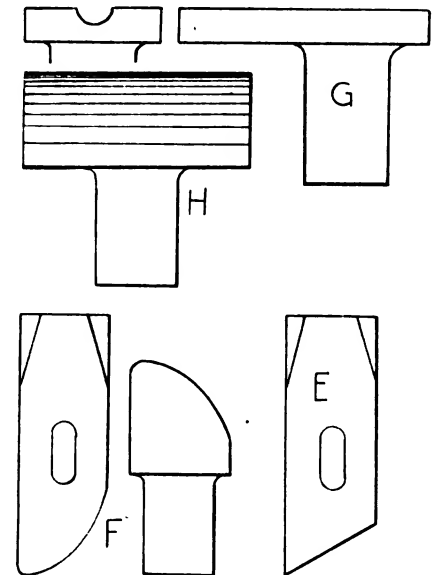


FIG. 2.—THE HAND-MADE TOOLS WILL STAND UP BETTER.

ments. In making these dressings it is well to observe the rule of using only the best materials. Odds and ends of this and that material do not make a reliable dressing and should not be used on leather and rubber.

Tops and the leather and rubber furnishings upon reaching the paint shop should be assigned clean storage quarters to which access may be easily had. A good strong rack is best, so constructed that two tiers of tops may be stored therein. By this arrangement the room space may be utilized. Even the third space above the two tiers of tops may be

### Another Line Added

THE "SMITH-STORE" has now seen four summers and is still growing.

### We Are Continually

upon the lookout to supply customers' wants, and in an effort to make you still more of a buyer we have added

### Barn Brooms

to our list of supplies. These, as all things at the "SMITH-STORE," bear the Thornton stamp of quality and are worth every cent of the price asked.

**THORNTON, SMITH,**

Third Street.

used for storing the carpets, cushions, storm aprons, side curtains, boot, etc. If no better arrangement offers draw a curtain in front of this rack which will materially assist in preventing the accumulation of dust etc.

The top joints, shifting rail and even the bows, if badly worn will need attention as the other parts of the vehicle are brought up to the finish. The joints and shifting rail, if chipped and fractured on their paint surface, as they are quite likely to be, should be sandpapered, coated with lead, and when dry glazed over with putty, reduced to a glazing consistency. A piece of pliable harness leather is useful to smooth out the glazing putty upon joints, rails, etc. A top never looks finished unless the metal fittings are finished up nice and smooth.

### A Novel Pulley.

BY A VILLAGE BLACKSMITH.

When we put in our gasoline engine, put up the line shaft and proceeded to belt up our machines, we run short of line shaft pulleys. We needed a 4-inch pulley to run the power drill and after thinking over several methods of constructing one, we hit upon the following plan which has proved very successful. First, we got an old tow sack and cut it up into strips about 8 inches wide. Then we got a pot of tar and after giving the line shaft a good coat of the tar and applying some to the strips of sack we began to wrap them around the shaft,

being careful to wrap them the same way the pull of the belt would come, so they would draw tighter all the time. We continued to apply tar and strips until we had built it up to the required size, then we put on the belt and went to work. The pulley has been in constant use for 2 years driving a No. 14 Western Chief drill and is just as good as the day we put it on.

### Thornton Talks on Advertising

"Advertising," said Thornton, "is the blower which causes the blast of patronage to brighten the fire of business. It must be applied continuously and forcefully. No half hearted efforts will bring the desired results. You must keep persistently at it if you desire an unbroken flow of returns. You can no more advertise enough in one week to last you a year than you can blow sufficient air into a fire in one day to last you a month. Another point regarding advertising is truthfulness. I firmly believe that advertising should be plain simple truth. The nearer it comes to unvarnished, simon-pure fact, the better it will be for the advertiser's business, profits and standing. I make a practice of getting out nothing but the best—I pride myself on having best workmen, best materials, best workmanship. I tell this fact truthfully in my advertising. I am a crank on quality and I tell people so."

"What kind of advertising do I use? I run an ad in every issue of our newspaper, mail circulars to prospective customers, send out inserts in all my mail and use neatly printed cards in my shop. When ever anything of great importance goes on in town I get out special advertising matter and see that it is circulated among the farmers, who naturally come in for the meeting or celebration. Another thing, I always keep my wagons and carriage in good repair. The two wagons bear my business card and are loaned to customers while their vehicle is being repaired or painted. For the convenience of automobilists I have placed on all the roads leading to town neatly printed signs, which inform the unlucky that 'Thornton does all kinds of auto-repairing. His phone is number 761 and his repair wagon is always ready.' The fact that many farmers now have telephones, helps me considerably to take care of the broken-down touring car on the roads."

"My circulars are always gotten out just as neatly as possible. One mailed recently was printed with dark blue

ink on light blue paper. The word "Quality" appeared on the cover and the talk was a very strong one on this subject. Another circular of tan colored paper with black ink was a talk on horseshoeing. I always insist upon a good clear style of type and steer clear of the stock ornaments and gew-gaws kept in every print shop."

"The advertisements that appear in the paper are the best explanations of this kind of advertising for the smith. I make my ads. tell something that is interesting to the reader. When a smith places his card in the paper and says, 'John Smith, Blacksmithing and Horseshoeing,' he tells nothing that will bring the reader to John Smith in preference to Brown. I explain why the reader should trade at Thornton's, why he should prefer my work and I do this without knocking any of my competitors."

The several advertisements shown on these pages are examples taken at random from Thornton's proofs and show exactly the style in which they originally appeared.

### How to Forge a Gaff Hook.

E. H. BAKER.

My method of making gaff hooks, I hope those interested will be able to understand. I will commence first with the solid band hook or one to be forged from solid stock. Suppose we wish to make a gaff hook with the band 2 inches in diameter. Let it be understood at the start that this kind of gaff hook cannot be made of poor iron. It must be the best and for small size gaff hooks. I use

## Horseshoeing

OUR INSISTENCE upon quality is not more stringent than when we shoe horses. We carefully examine the worn shoe so as to know just exactly what the animal needs. Defects are thoughtfully looked after and a personal interest taken in the case. Should you have an animal especially difficult to shoe we shall feel honored to show you how easily it is done at

**THORNTON'S,**  
THIRD STREET.

Norway iron. I take a piece of stock about  $\frac{3}{4}$  by  $\frac{3}{4}$  and long enough to hold without tongs till I nearly finish it. To



draw out the hook I heat the end to be worked and punch a hole in the center of the stock, about  $\frac{3}{4}$  of an inch from the end. I then punch another hole about  $1\frac{1}{2}$  inches below the first hole and on a line with it. Then I take a cold chisel and cut out the bridge, reheat and force it open, so it will take the tip of the anvil

## Satisfied Customers

are the best kind of advertisement for the Smithing Business.

We try to get customers to satisfy—and then we satisfy them all.

We used to find it a hard task—but since it's known that we DO satisfy our customers, it's an easier matter to get customers to satisfy.

**WE WANT YOUR TRADE**  
**THORNTON, SMITH.**

THIRD STREET.

horn. Then I hammer it out on the horn until the ring is of the diameter wanted. Now comes the hook. Heat and cut off the stock below the ring, leaving enough stock to draw upon for the hook. Then heat and hammer this down to a true taper. Now heat the end in which the eye is to be made and if the  $\frac{3}{4}$ -inch stock left for that purpose has been battered somewhat out of shape, draw it out to about  $\frac{3}{4}$  of an inch and punch the eye hole in it. Then turn up the hook to the shape desired and true the ring and dress up the job and the gaff hook is done.

If a larger ring is desired and the solid hook is wanted, of course, larger stock must be used, but for gaff rings of from 4 to 6 inches in diameter, I proceed as follows: Take a piece of stock of the width and thickness wanted for the band say 1 by  $\frac{1}{2}$  or  $1\frac{1}{2}$  by  $\frac{1}{2}$  inch. Good new tire iron will do for this. Take a piece of this stock about 18 inches long, heat this in the center and douole it together, hammering the end down well. Then take a welding heat on the bent end and weld the stock together nicely for about one or  $1\frac{1}{2}$  inches, depending on the size of the eye hole to be made. After welding up, punch a hole in this end and work out to the size wanted. Then

measure off or calculate the length of stock required to make the band and the hook and cut off the surplus, if any. Then weld the hook end nicely, leaving stock enough unwelded to open and shape up to make the band, and then draw out the hook. This being done, reheat, open the band and true up on the cone or mandrel till it is perfectly round. Then reheat the hook end, turn up the hook as wanted and the job is done and the hook ready for use.

### Why so Few Young Men Learn the Blacksmith Trade.

W. B. K.

One reason is, a blacksmith can not give an apprentice very much pay, and can not teach him very much short of two or three years. And the apprentice thinks that he would have to work too long for almost nothing. Of course he does not stop to figure that when he knows his trade it will pay him well for the time spent. Another reason is that a boy of 16 can earn, in this community from \$16 to \$22 per month, board included, working on the farm. He doesn't think that he can afford to learn the trade at the rate of about \$25.00 per year and board, for 2 or 3 years. I do not know what the rules are in taking apprentices but when I served, I got \$15 the first year and \$35 the second year. But I feel that at present I am being well paid for the time spent.

### A Machine For Filling Wagon Wheels.

D. M. LOVE.

Now that spring is here and wheel work is commencing to come in, perhaps some of the craft would like a little help on filling wagon wheels. In the country shops, where all kinds of repairing is done, we have to economize on room as much as possible. We cannot have a place fitted up expressly for filling wheels as they have in large shops. Many of us get along without much of any place, although we must have a wheel jack on which to screw wheels while putting on rims. This jack can also be used for filling wheels if we have something to hold the spokes while driving.

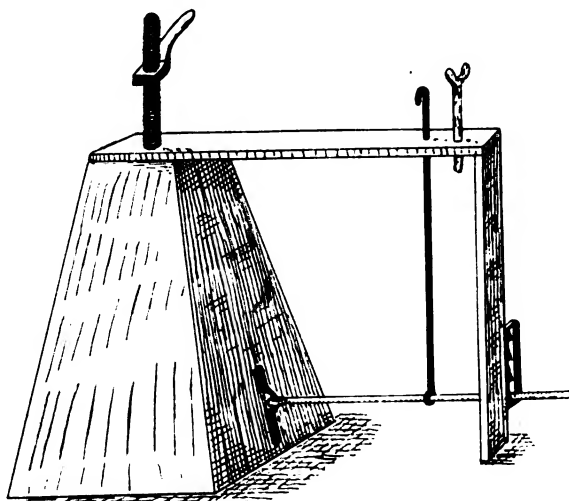
The accompanying engraving shows an arrangement I have used for some time. I give it here, hoping it will be of use to some of the brothers. Take a plank  $1\frac{1}{2}$  by 8 inches by 2 feet, and taper one

end down to three or four inches. Bore a hole in the wide end for the wheel bolt and place on top of jack. Bore a small hole in one corner for a pin to hold the plank from twisting around. Fasten a leg under the free end of plank, to hold it level with the jack. Now measure 18 inches from the wheel bolt and place a  $\frac{3}{8}$ -inch T bolt with a long thread, so it can be screwed up or down to fit the wheel. While driving, the spoke will rest on the bolt. Now put an iron plate on the side of the jack with 2 or 3 notches in it to hold the end of the treadle. Run a rod from treadle up through the plank to hook over the spoke and hold it down on to the T bolt while driving. Then make a cone shaped block, to fit into a wheel, with a hole through its center for the wheel bolt. Then when hub is screwed down it has to turn true on the bolt. Two or three sizes of these blocks will fit all wheels.

### A Plea for Better Prices.

BY A VILLAGE BLACKSMITH.

What is the use of spending several years of your life learning the trade, then investing your money in shop and tools, working early and late striving your very best to do good work and please the public and then charging just enough for your services to keep body and soul together and never have a dollar to lay aside. Seventy-five per cent. of the smiths of my acquaintance are doing this very thing. One of the greatest drawbacks to the craft is the fellow who claims to be a "Jack of all Trades". He tries farming and starves out. Then he tries the carpenter trade,



A MACHINE FOR FILLING WAGON WHEELS

but don't last long at that. Then after drifting around a while and trying his hand at odd jobs, he makes up his mind to become a blacksmith. He buys an old second hand set of tools and rents an

old tumbled down shop and sets to work, perhaps in opposition to a man who has been at the forge for 20 or 25 years. What chance has he got to succeed? Not one. What does he know about making a plow share, pointing a plow, welding on axle stubs, pointing a mouldboard, dressing rock drills and the like? He may be able to "slobber" it over and half-way succeed, but when it comes to turning out a nice neat workmanlike job like the "old-timer", he can't be seen. The result is easy to guess. The "old timer" gets the big end of the trade and the "new man" tries to get even by cutting prices.

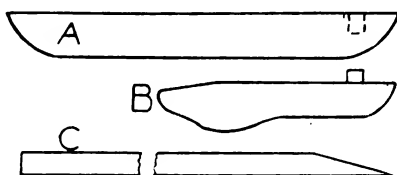
The writer knows of several just such instances as this and they are responsible for much of our low prices. But some will say, "Don't pay any attention to this fellow, just hold up to your prices and you will be all right." To such I will say, you try it. You try charging \$1.50 for shoeing and let the other fellow shoe for \$1.00. You charge 25 cents for sharpening a plow share the other fellow 15 cents. You charge 50 cents per tire for setting tires, he charges 25 cents per tire. Try it and see how you succeed. I have tried it and find it a hard job. The only successful way of raising the standard of wages is for all the smiths of a town or community to get together and agree on a scale of prices and each one adhere strictly to them. Such a course would do a great deal toward creating a feeling of fellowship and goodwill among the smiths and be a great thing for the up-

the near future, I will submit a scale of prices which I think a first-class smith should receive for his services. I have been a constant reader of THE AMERICAN BLACKSMITH from the first issue and consider it the greatest paper of its class that has ever been published. No smith or wagon maker should be without it. Every issue is worth one years subscription. And above all else it gives us the opportunity of exchanging views with each other, which it is to be hoped will greatly improve our condition in every respect.

#### A Combination Wood Planer and Circular Saw Bench.

W. D. BOETTNER.

The accompanying engraving shows a common wood planer and saw bench



TOOLS FOR REMOVING DENTS FROM GUN BARRELS.

which I built and use in my shop. I run it with my gas engine and it saves me lots of hard work and valuable time. I can dress any thickness of lumber by simply pushing the piece over the table, the knives planing it on the bottom. The table, being fastened to the frame by bolts and supported by wedges, allows it to be raised or lowered according

to the near future, I will submit a scale of prices which I think a first-class smith should receive for his services. I have been a constant reader of THE AMERICAN BLACKSMITH from the first issue and consider it the greatest paper of its class that has ever been published. No smith or wagon maker should be without it. Every issue is worth one years subscription. And above all else it gives us the opportunity of exchanging views with each other, which it is to be hoped will greatly improve our condition in every respect.

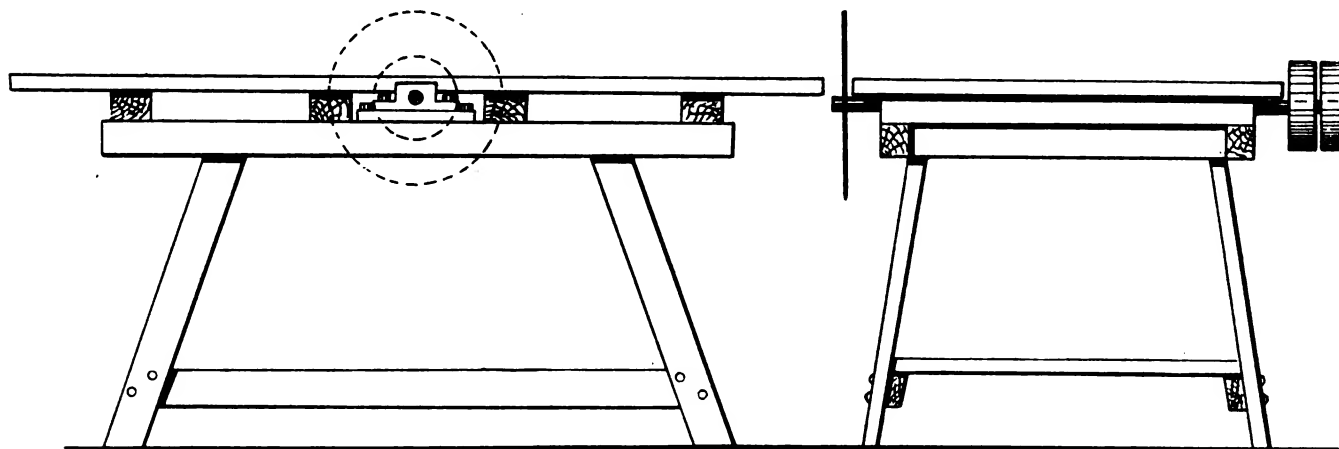
frame and table are made of hard wood. The shaft runs in two babbitted cast iron boxes bolted on the top of the frame and under the table as shown in the engraving. For the reception of the planer knives, there is a long oblong mortise across the table top at the center and just large enough to allow the planer knife cylinder to turn so the knives will be just a trifle higher than the top of the table.

The dimensions of this machine are as follows: The table top is 5 feet long by 30 inches wide; main frame 4 feet long by 25 inches wide by 28 inches high. The frame is made of 2½ by 4-inch oak.

#### How to Remove Dents From Gun Barrels.

E. C. JOHNSON.

The smith in the rural districts is often called upon to remove a bad dent in a barrel that has fallen upon a stone or some hard substance. Here is a tool that will do the job if a little care, a little oil and a little good judgment are used. To make this tool I take two pieces of ¾-inch half round iron, one piece B 3½ inches long and the other piece A five inches long. Put them together and file them down until they are slack at the muzzle of a 12-ounce gun barrel. Now half an inch from the end in the longest piece put a ¼-inch rivet. In the short one, drill a hole in which the rivet will fit loosely to keep the pieces together in the barrel. Now file the 3½-inch piece oval as in the engraving and make a short taper wedge so as not to



A COMBINATION WOOD PLANER AND CIRCULAR SAW BENCH.

building of the craft, in every respect. In conclusion, get better prices for what we do. Why struggle along at the same old prices. Many of us in modern shops, with gasoline engines, trip hammers, emery grinders, power drills, band saws, turning lathes, etc., not very good things to keep company with low prices. In

to the depth of cut desired. The two knives I use, are 20 inches long and are fastened on a planer head or cylinder. As shown in the engraving, I have a 4-inch pulley on one end of the shaft and a 16-inch circular saw at the other end. This saw I use for ripping lumber that is too wide or too thick. The entire

stick too tight in the spreader. Now place tool in the barrel opposite the dent, (short piece next to dent) warm the barrel on a hot iron at the dent, put oil on the wedge and drive with a light hammer. The dent will come out very easily. A good size for the wedge is about 18 inches long and made of a

suitable stock. This tool is very effective on even the more badly dented barrels, though ordinary precaution must, of course, be exercised to prevent the possible bulging of the barrel.

### An Old Shop in The State of Maine.

EVERETT. H. DAVIS.

The shop I am now running was established by my father, W. P. Davis, sometime in the 60's. Father learned his trade by serving a regular apprenticeship with his brother at Walnut Creek, California, where he had gone at the age of 19, the journey to California being made by way of steamer from New York to Panama, across the Isthmus by rail and again by steamer to San Francisco. After several years experience at his trade in various cities in the western states, he returned to his native town in Maine, bought a farm and built a smith shop. The large sign bearing the word "Blacksmithing" in large letters, put up at that time, still retains its place of honor over the door where it has hung for nearly forty years. Mr. W. P. Davis has now passed away but he is still remembered as a good business man, an honorable citizen and a christian. His last work in the blacksmith shop was the setting of a heavy cart-wheel tire. The size of the tire being 4 inches by  $\frac{1}{2}$  inch. This job he finished alone. When you consider that he was over sixty years old at this time you will have some idea of his great strength. And now I am endeavoring to fill his place in the shop and in the family, as best I can. The accompanying engraving is a view of the interior of the old shop and shows Mr. W. P. Davis at the anvil.

### Repairing Sarven Patent Wheels.

E. A. BARNARD.

If you have one or more spokes to put in, take out all the rivets necessary, replace your spokes, set the tire and put your rivets in. If, however, you have all the spokes to put in, take out every other rivet, or in other words 4 rivets. Take out all the spokes, being careful to save 2 spokes for a pattern. Now take 2 new spokes, fit them exactly like the old ones, making them 1-32 of an inch thicker. Now put the 2 spokes in the vice and bore a hole in the center of the spokes, like in the old ones, use good glue and drive one on each side of a rivet. Do the same with the other rivets, until you have 8 spokes in pairs around the wheel. Then fit and drive the other 8 spokes in pairs and let the wheel stand over night, or until glue has

set. Then put on the felloe and replace tire bolts and rivets and you will have a first-class job. It is expensive, however, to respoke a wheel all new. If customer does not feel like paying for that kind of a job, I try and find an old patent wheel, cut down to size, put on felloe and tire, and I get a good job and a good price for the job.

Mr. H. N. Pope in the November issue, gives a good talk on power in the shop. We have power in our shop and would not be without it for twice what it costs, as I can do more and better work in less time. We have the best equipped shop in Plattsburgh and we don't do anything but repairing, because you get more for repairing than for new work, providing you can do the work quickly, as most all customers want to bring their work home at night, if possible. We get more work and get better prices for the same piece of work than do any of our competitors. For instance, a customer brings a wagon or carriage for repairs. The helper is put to work taking things apart and

blacksmiths, with your kind permission, I will try to explain. I have worked in about 15 or 20 different railroad shops and in about every shop I have worked the custom for separating a broken yoke from a draw head is to cut the heads off the rivets with a chisel. Now, the kink I have reference to is the one I saw at the L. and N. Shops in Mobile, Ala., where the parts are separated by one blow from the steam hammer. A bridge or saddle, as some call it, is made to fit over the rivet holes in the draw head, the legs resting on the edges of the yoke above the rivets. This is made long enough to clear the draw head after the rivets are sheared. The next tool that goes with this is a block made to fit the bottom part of the draw head under the rivet holes and between the yoke, and thick enough to allow yoke to fall far enough to shear the rivets about  $1\frac{1}{2}$  inches from the bottom die of the hammer to the bottom of the yoke, as the rivets are  $1\frac{1}{2}$  inches in diameter. You will note that the shearing is done,



AN OLD SHOP IN THE STATE OF MAINE.

getting things ready for the smith. We always manage our work so as to get it out in the shortest possible time, and find that a customer appreciates it enough to be willing to pay the difference.

### A Pointer for Railroad Smiths

WM. P. CARROLL.

Being a subscriber to your valuable paper and desirous of suggesting a kink to the craft, and especially railroad

not under the head of the rivets, but between the yoke and the draw head. This makes a clean job and it is all done with one blow. Tis true, the draw head sustains a good jar, but I never saw one crack yet, and I have seen hundreds severed in this way. It also does not hurt the holes in the yoke, as all yokes that are taken from broken draw heads are used again.

## Procrastination.

ANONYMOUS.

There's a little mischief-maker,  
That is stealing half our bliss;  
Sketching pictures in a dream-land  
That are never seen in this;  
Dashing from the lips the pleasures  
Of the present while we sigh;  
You may know this mischief-maker  
For his name is By-and-By.

He is sitting by your hearthstones,  
With his sly, bewitching glance,  
Whispering of the coming morrow  
As the social hours advance;  
Loitering 'mid our calm reflections,  
Hiding forms of beauty nigh;  
He's a smooth deceitful fellow,  
This enchanter, By-and-By.

You may know him by his winning,  
By his careless sportive air;  
By his sly, obtrusive presence,  
That is straying everywhere;  
By the trophies that he gathers  
Where his sombre victims lie;  
For a bold determined fellow  
Is the conquerer, By-and-By.

When the calls of duty haunt us,  
And the present seems to be  
All the time that ever mortals  
Snatch from dark eternity,  
Then a fairy hand seems painting  
Pictures on a painted sky;  
For a cunning little artist  
Is the fairy, By-and-By.

'By-and-By,' the wind is singing,  
'By-and-By,' the heart replies.  
But the phantom just above us  
Ere we grasp it ever flies.  
List not to the idle charmer,  
Scorn the very specious lie—  
Do not e'er believe or trust in  
This deceiver, By-and-By.

The edge, not the flat side of an emery wheel is for grinding.

Don't be content to be simply a good smith—be also a business man.

It isn't workmanlike to allow the file to strike against the vise jaws.

Drain the cylinder jacket these days or use an anti-freezing solution.

He will never become a blacksmith who is easily discouraged by failures.

The grandfather of the new president of France is said to be a blacksmith.

Before pouring babbitt metal be sure the box is thoroughly dry and free from rust.

Ride a hobby if you wish, but be sure it's strong enough to bring you safely home.

The ancient Romans, we are told, wore rings made of iron, often set with precious stones.

Called that meeting in your county? Organization is the order of the day—better get in line.

Anticipate the usual spring rush by getting customers to bring in their farm implements now.

Before trying again, study the situation. There must be something wrong, if at first you don't succeed.

None too early to prepare for spring. Old tools in repair—scrap cleaned up—new tools and supplies ordered?

May be there isn't a new comer to your neighborhood, but if there was, would you have made a business call?

It takes a little effort, but it's well worth while. And customers will gladly come into a neat, clean, tidy shop.

"By hollerin'," said the fruit-vender when asked how he made his money. How much noise is your advertising making?

The world demands that you do your work with all your might and ability. That you be a master—a king, in your line.

Buy a hammer and a cold chisel if you haven't any, but never use a monkey-wrench and a screw driver in place of them.

The occasional customer of to-day may be the regular patron of to-morrow. Pains-taking care pays on even the smallest job.

It's impossible for the vehicle painter to be too clean or too careful. Closest attention to every detail, should be his motto.

Do you pay any attention to "Prices Current"? Market values are worth watching and often present a chance for more profits.

Don't knock because your neighbor is prosperous. Speak well of him, your time will come. Use your hammer on your anvil.

And still we continue to hear of new ones. The latest is a frog farm with 2,000 young frogs. "More profitable than chickens" says this smith.

Don't try to show your superiority by words. Good work speaks louder than a steam whistle and doesn't grate on the nerves nearly as much.

A Pennsylvania smith with a power shop charges five cents for the use of his grind stone. "This keeps Tom, Dick and Harry from grinding holes in the stone."

You can no more expect good work from poor workmen or strong wagons from poor material, than you can grow healthy plants and flowers from poor diseased seed.

"I call as soon as I hear about him and give his work my personal attention, until the boys get onto his ways," said Thornton, when asked regarding his success with the new comer.

Like the farmer who plows, but doesn't sow, is the craftsman who does without a craft paper. Both knowingly deprive themselves of something essential to greater profits and success.

One smith we know, follows carefully the manual training articles in these pages, and, as far as practical applies the school system to the training of his apprentices. "The apprentice question doesn't affect me" says this man.

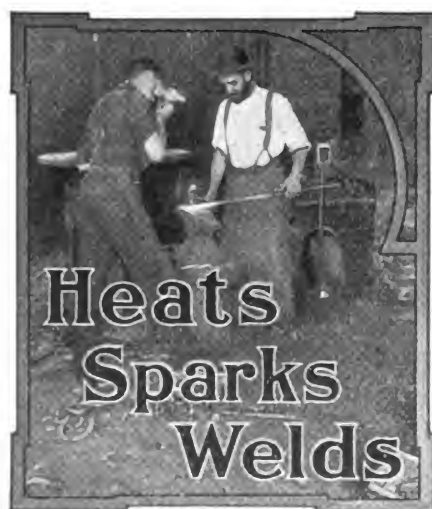
You can't run a large business at all without system; and it's a mighty big aid properly conducting a small. What arrangements do you have for checking the correctness of the bills you get or making sure that every job you do is charged up without fail? And collections, too; do you let them take care of themselves? A good system carefully followed helps wonderfully.

Stick a Buffalo stamp on every letter you write to merchant, manufacturer or fellow craftsman. Their bright color will attract attention to your communication, and "stamp" you as a progressive reader of up-to-date literature. Half a million of these "Buffalos" have been sent scurrying to all quarters of the globe in Uncle Sam's mail bags. There is still a big herd left in our corral, so if you didn't get your supply, drop us a postal and another lot will come post haste.

Electricity from garbage—A plant recently erected in Switzerland for this purpose is capable of burning 120 tons of garbage in twenty-four hours. The electric power produced is used first in the plant and to supply part of the power for the electric railroads of the city. Complete combustion of the garbage does not take place. From 30 to 40 per cent. of its original weight remains in the form of slag. This slag, by mixing with lime, is used for making bricks and paving blocks. The plant is said to be paying well.

We personally delivered a January paper to Tom, and, feeling pretty proud, we wanted him to comment favorably on it. But all he said when we stopped in a few days later was, "It's all ads. I thought you were going to have something special." Of course, it would be useless to explain to our friend that the big issue carried the initial announcement of some twenty new tools and that the advertising section brings before the smith the latest and best in labor saving appliances each month. But then Tom doesn't believe in advancement.

Interesting data is that concerning the strength of steels for automobile purposes. Low carbon steel will show a tensile strength of 60,000 pounds per square inch of cross-section, with an elastic limit of 40,000 pounds. The high-class carbon, shows 85,000 pounds tensile strength and 55,000 pounds elastic limit. Nickel steel annealed, 85,000 pounds tensile strength and 60,000 pounds elastic limit. With special treatment its showing will be 100,000 and 70,000 respectively. The chrome nickel steels will test at 90,000 and 65,000 pounds annealed and 250,000 and 150,000 with special heat treatment. The maximum commercial limit that has been reached in chrome nickel steel is 275,500 pounds tensile strength and 183,000 elastic limit.



Don't put calks on the shoes unless needed. Brains have always accomplished more than luck.

Forty thousand before next January—are you helping?

Those New Year resolutions—haven't forgotten them?

Advertising is the egg from which success is sure to hatch.

Did you ever try to mark tempered tools with steel letters?

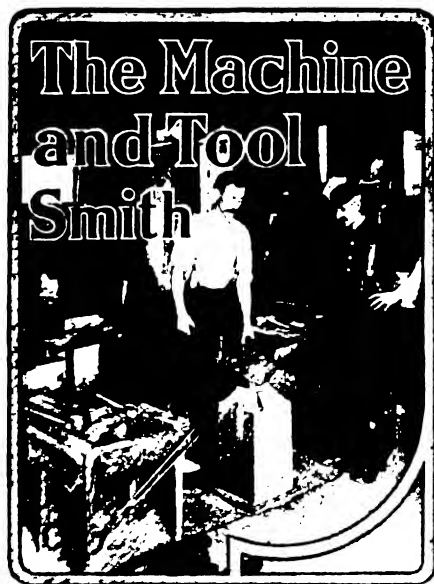


### American Association of Blacksmiths and Horseshoers.

The following is an extract of a letter received from one of the Association's staunchest supporters. It is addressed to those localities with no association.

"Let us, in this new year, fight more actively for organization and the betterment of the craft. I am willing to offer my services free to the first county holding a meeting any place within a hundred miles of Cortland, N. Y. After you notify every smith in your county, fix the place to hold the meeting near the center of the county, name the night of meeting and notify me a few days ahead and I will go and help you to organize. All I ask is my car fare and hotel bill. Now, I do this because I think if we can get started the next county will take hold and we can soon make it a success. I know if you get the ball a rolling that THE AMERICAN BLACKSMITH Co. will help you all in their power. Now, brother smiths, I would like to hear from some of the rest of you on this matter. I have put in thirty-one years at this business and have been from Albany, N. Y. to Seattle, Washington. I know the deplorable condition of our craft and although I do not intend to work at it much longer myself, I do want to see the coming young man have the legislature to protect him. I remain your brother smith, Daniel Ferron, 9 Lincoln St., Cortland, N. Y."

Mr. Ferron has organized branch associations in all parts of the country and is well experienced in this work. Interested readers may address letters either direct or care of The American Association of Blacksmiths and Horseshoers, P.O. Box 974, Buffalo, N. Y.



### Hardening and Tempering Steel.—5.

E. R. MARKHAM.

Is Steel injured by forging?

In shops where steel is welded to iron as in making trimming dies for use in drop forge work and other processes where it would not be policy to make the whole tool from high grade steel great care must be exercised so the steel

is not rendered unfit for use by the high heats necessary when welding. For such work a high carbon steel does not give best results, it being advisable to use steel containing as low a percentage of carbon as is consistent with the work to be done. In many shops a good grade of open hearth steel containing from 60 to 70 points carbon welds very nicely and yet is not easily injured by moderately high heats.

The welding should be carefully done, the pieces allowed to cool and then annealed. The annealing not only insures the steel being soft enough to work, but it restores the grain to its normal condition. From an extensive experience in this line of work the writer is enabled to say that steel cutting portions can be welded to a low grade steel or iron base, and if the heating is carefully gauged the hammering properly done, and the piece carefully annealed, the steel seems to suffer no ill effects and hardens nicely.

I have seen steel welded to wrought iron for construction purposes and when tested the steel would break before the iron even though the area at the breaking point was much greater than that of the iron, which apparently was not affected. This was occasioned by the high heats necessary in welding which did not seem to affect the iron. However when these pieces were allowed to cool off after forging, and were then heated to a low red and allowed to cool where no current of air could strike them, thus annealing the steel, it was found to be exceedingly strong and would stand a much greater test without breaking than would the iron.

In order to give this a fair test a piece of 40 point open hearth steel was welded to a piece of good grade of wrought iron, tested without annealing. The steel was found to break comparatively easy. The same thing was repeated only the piece was annealed. The steel under test stood a greater strain than the iron, so that while in reality the operation of welding caused the steel to become brittle, yet this effect was overcome by restoring the structure by annealing. However, it is not wise, generally speaking, to weld high carbon steel to iron, or to weld it at all for most purposes if it can be avoided.

In the construction of swageing machinery it is necessary to use rings ranging from 14 inches to 30 inches diameter. At times the welding of the ends of a piece of flat steel to form the ring has been attempted, but in most instances they developed flaws when hardened, and it was found advisable

to open a piece of steel in the middle and forge the ring without welding. The operation of forging the steel into the form of a ring did not apparently injure it any—it being 120 point carbon crucible steel—but the operation of welding did not give satisfactory results when the piece was subjected to the intense strain incident to hardening.

This subject might be enlarged upon and many articles written on it; but, in conclusion I am free to say that for most purposes forging *properly* done, decidedly improves steel. However if a skillful smith is not to handle the steel, I should say do not do any more forging of tool steel than is absolutely necessary.

(To be continued.)

### A Few Observations on Steel FARNHAM.

Some smiths claim they can tell the quality of steel by the thickness of the scales formed upon it in heating and working. There may be something in that, but what about the scales when the smith puts a piece of steel in the fire and forgets it. If such a piece required hardening it would crack or, when it came to be used, would prove worthless as a tool.

I was not long since in a small jobbing shop where a smith was dressing stone-point for use on granite. In talking with him about his business he told me that he did a very good business on stone tools but did not sharpen quite so many in a day as some other fellows did. I noticed he was very careful in heating and as he fixed the tools he would lay them down by his fire until the lot was fixed. Then he would harden the lot previously fixed by laying two or three in his fire, allowing them to come up very slowly in the heating. I asked him why he did not harden them as he went along and he said "I have *hammered* them and they need a rest before drowning." I agree with him and believe that every tool should have a rest after forging and previous to hardening. And I would say to every tool dresser, after you have made a tool, whether it is a chipping chisel, lathe or planer tool, (anything that requires to be hardened and is not going to be annealed) heat it over a low fire, after forging, and lay it aside to cool, then reheat and harden as you want it. If your foreman should find fault about this, just tell him what you think about such matters and keep yourself busy on another job, while that is getting cool.

I know of a tool dresser who has a great many chipping chisels to fix and he goes about it in this way: He banks

up his fire on two sides and puts a flat piece of iron across the banks and as he gets one chisel fixed, he heats it about three inches from the cutting end and lets it lie on this flat iron. He continues this until he has 18 or 20 tools or all he has to fix. He then takes the first ones and heats them very carefully. And after brightening them with a rough stick, puts them back on the piece of iron, keeping a "sharp eye" on them and as the temper runs down to suit him, he throws them into a pail of water. It is very seldom that he has any chisel come back to him split or broken. It's common practice with this smith to harden milling cutters and even lathe tools without drawing the temper on them. Thirty-five to 110-point carbon is supposed to be right for chipping chisels but this man made a chisel as an experiment from a bar that when analyzed showed to be 128-point carbon. The machinist who used this tool said he never had a chisel stand up like it. In talking about tools etc. this smith says it is all in the heating. Knowing about the percentage of carbon in the steel, he claims that any cutting tool not subject to shock does more work when hardened at the right heat and no temper drawn, than a tool carelessly hardened and tempered by the best improved methods. He says, that a tool dresser could not spend a half hour two or three times a week, more profitably to himself and his employers, than by taking pieces of steel or short lathe tool, and drawing them out and hardening at different heats, and then breaking them and examining the fracture to see how fine a break he can get with the lowest heat, and have them hard. While doing this, note the different force it takes to break a piece that has been hardened at the least heat and have it hard enough to be used as a cutting tool. By this time it seems to me that it would be well for a tool dresser to make himself familiar with the steel that he is using and find out from your foreman the different carbons being used in the shop and what they are.

A word about drawing out steel under a power hammer that has wide dies. It can be done better on narrow dies for this reason; the wide dies will not draw out lengthways as readily as narrow ones (the force of the blow being the same). Under wide dies the metal will flow sideways and when the piece is turned over the same thing will happen only in the opposite direction. After a few blows from the hammer the center of such a piece will become hollow and if you harden a piece drawn out in

this way, it is very apt to split the whole length. Anyone would say naturally enough that the steel is no good, perhaps made from a pipe ingot. And yet the writer has seen just such pieces illustrated and commented upon as a pipe

arms T and K hold a single purchase wench, which is a great help when hoisting sails or handling weights from any part of the deck. The belaying-pins and balls are to fasten the halyards to. The elevation view shows two bands A

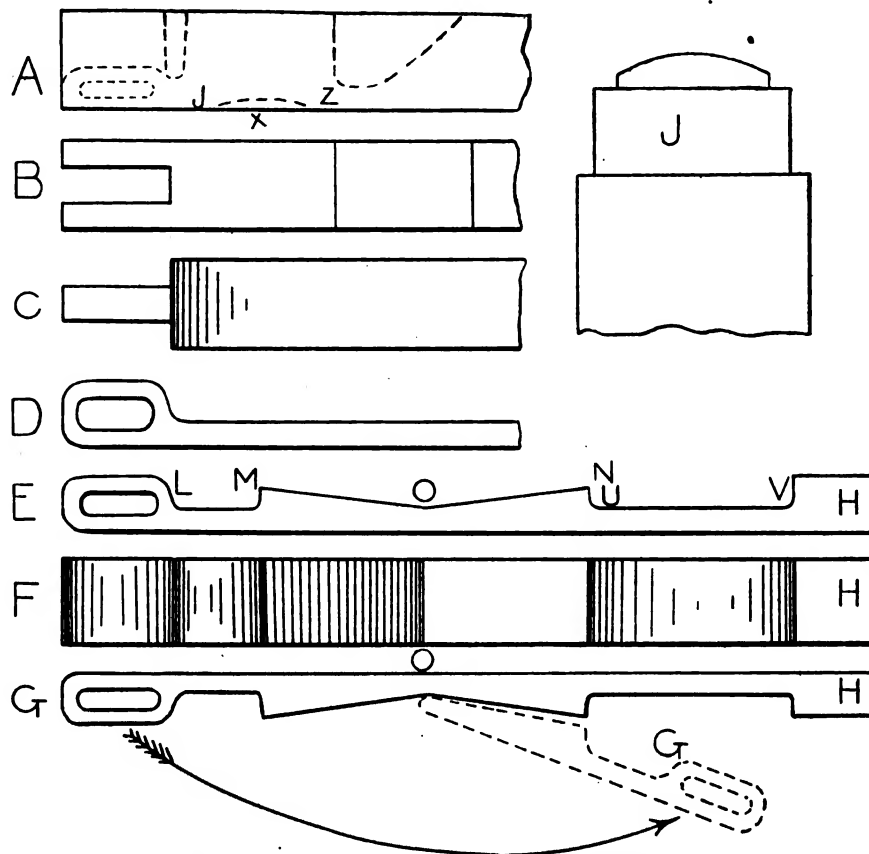


FIG. 1.—FORGING A GOOSE-NECK BAND WITH WENCH AND BELAYING PIN BALLS.

ingot. It is true there is such a thing as pipe blows and seams in steel, but a fracture from a pipe can be distinguished from the one just described. Nearly the same thing happens on large pieces, when hammered too cold with hard blows. The outer surface being much colder does not move ahead as fast as the center. Anyone can readily see what may take place when such a piece came to be hardened. On the other hand steel drawn under narrow dies is carried along throughout its whole mass, so that center and outer side are moved together. These things are more noticeable in the higher than in the lower carbon steels.

#### Forging a Goose Neck Band. Wench and Belaying Pin Balls Attached.

C. H. RICHARDSON.

The band here represented is used mostly on yachts and is placed near the deck, the average distance from the deck being about 4 feet. It is fastened to the mast by the two draw eyes X and Y. The large eye Z forms the socket for the goose neck jaw to slide on. The two

and B, on the mast. On A there are no belaying pins and the band is just a simple key band with the large jump Z through which a finished bolt passes to hold the goose neck socket or jaw swivels. In Fig. 2, S shows the side view of the swivel, and in Fig. 3 the jaw into which the goose neck fits. Two solid rubber washers are shown at R. R. These act as bumpers when the sail is being raised, and also when the vessel is in motion they keep the joint from jamming and sticking.

The general restriction given to the smith when work of this kind is intrusted to him, is to have as few welds as possible, good tough serviceable iron, and the fibres running in the same direction. For this band I used Burdens best iron and forged each separate part from the solid. The plan used was as follows: With material the size of the goose-neck eye Z and using a V necking tool, fuller the piece as shown at A Fig. 1. Draw the flat part that forms the part of the band at Y, turn the piece end for end and draw the distance J. Now dress off the end to make the key joint.

The best way to forge this joint from the solid is as follows; punch two round holes the size of the flat key in thickness and about  $\frac{1}{4}$ -inch short of the finished length of the eye. Now cut out the bridge that is left between the two holes fit the pin and dress the eye off square on all edges. With a pair of calipers lay the eye out so that when split the jaw will equal the single part of the coupling as at C. C when fitted should just equal the opening at B. Take this band for example; the entire width

The jump or goose neck eye should now be finished off, being sure to cut the sweep off the band in the jump as shown at X Fig. 1. This cut will aid you when bending the band. If the cutting is left till after the bending there is sure to be two light spots at the edge's of the jump as shown at J Z Fig. 1. These are in such a position that it is impossible to improve their appearance without forming a cold shut in the corners of the jump. This must be avoided.

The remaining half of this part of the

form the correct sweep on the inside. Both the halves with the wench arms on them should be made at one time. The belaying-pin balls should now be forged so they will be ready for welding onto the band.

Having all the parts forged we will now arrange them for welding. Already knowing the circumference of the ring, found by the method so often spoken about in this paper, we lay off each half of the band joining A G, whose length is about two thirds of the circumference from the center of one eye to the center of the other. The weld should be at P, Fig. 3. Now weld on the belaying-pin balls and bend this half to suit the full size sketch laid out on a clean straight sheet iron plate. The opposite half is finished next. This part of the band has only about one third of the circumference of the whole circle. The two halves being finished, heat the eyes drive the draw keys in place and straighten the work off.

#### A Few Pointers on Reshoeing Sleighs.

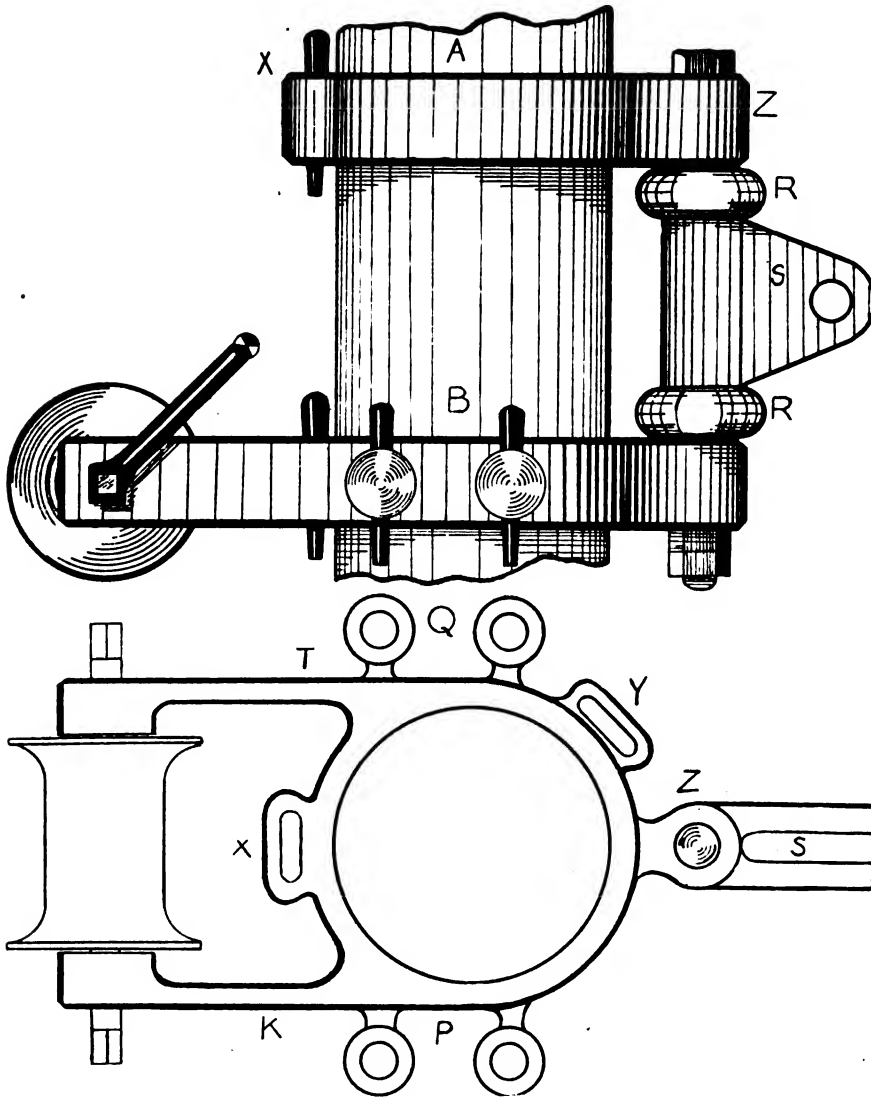
GEO. NABLO.

In many localities steel sleigh shoes are preferred to cast shoes, but they wear out sooner than the latter and have to be replaced after 5 or 6 winters wear. It is no easy work for a smith to draw the front part of an  $1\frac{1}{2}$  by  $\frac{3}{4}$  steel bar to a feather edge, especially when the smith has no helper to strike for him. Now steel shoes only wear out where they come in contact with the ground and the front or curved part is as good as ever. It is, therefore, much easier to weld the old unworn point to a new bar than to hammer out a new one. Besides, it is a saving in the amount of steel required. The old holes in the runner should be used and the holes in the shoe should be made with square countersunk holes, the bolts being headed in them and each one marked so there will be a good fitting head. Cutter shoes can also be renewed in this same manner.

#### Standard Sizes of Farm Wagon Parts.

DIXIE LAND.

Standard size of some parts of 2-horse farm wagons; say  $2\frac{3}{4}$  skein. Of course every factory has its own sizes but they run close together. Eveners should be 2 by 4 by 48 inches; single tree should be  $2\frac{1}{2}$  by 36 inches; neck yoke,  $2\frac{3}{4}$  at center by 44 inches long; straight-pole or tongue, 3 by 4 inches at butt by 2 by 2 inches at point, by 10 feet 6 inches long; bolsters,  $2\frac{3}{4}$  by  $3\frac{1}{4}$  by 62 inches and are 42 inches between the stakes. The stakes are usually  $\frac{3}{4}$



FIGS. 2 AND 3.--FORGING A GOOSE-NECK BAND.

across the eye is 4 inches, the single jaw should be two inches and the double jaw one inch on each side. Having the eye properly marked with a cold chisel, heat it and split out the joint, being sure to keep full of the mark, for it is much better to file in a tight joint than to have a coupling that is slack at the shoulders. I find that it is a good plan when the joint is roughed out, to heat, place the pin in its place and work the joint up with the flatter. This plan makes the joint easier to fit with the file.

band should now be forged as shown at E F G Fig. 1. The work should be completed in the same manner as the last half. That is starting with a piece large enough to make the wench end H Fig. 1, draw the distance U V M O N and L M and finish the eye. With a heat at O, bend for welding as shown at G, using a little compound between the laps. It is necessary to have a tool shaped like J, called a "round back". This tool should be rounded off to the same radius the band is to be, so it will

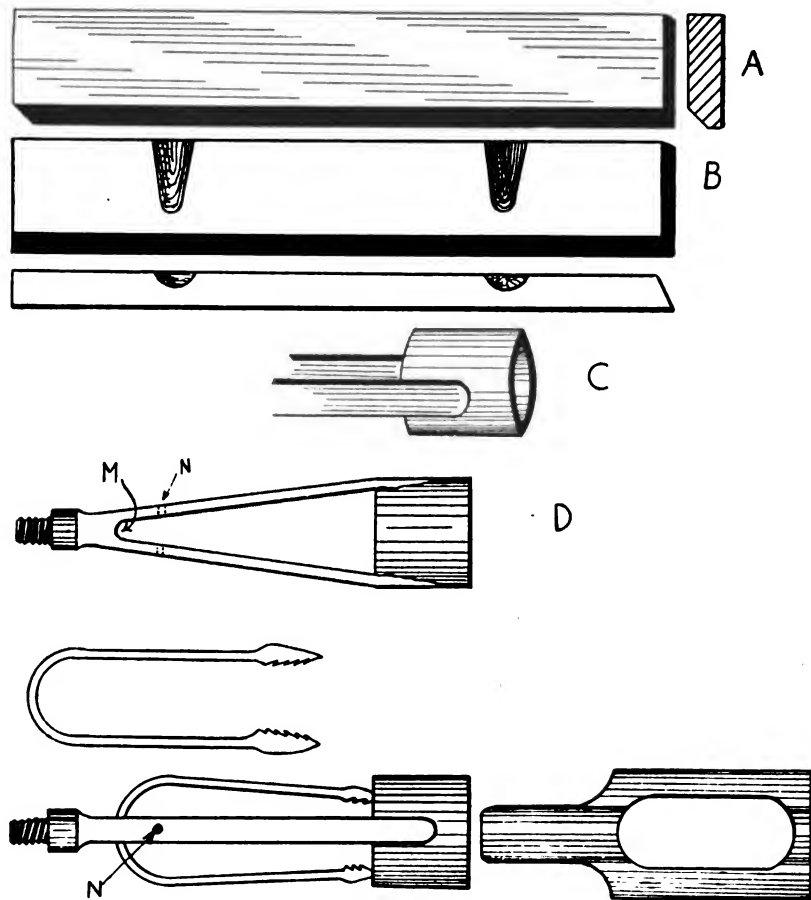
or  $\frac{7}{8}$  of an inch thick by 16 inches high, that is, full length with a 2-inch tenon on one end. The top end tapers to 1 $\frac{1}{2}$  inches and should be ironed with  $\frac{7}{8}$  by  $\frac{7}{8}$  band iron. The bolster plates you can buy cheaper than you can make them. Tongue braces should be 1 $\frac{1}{2}$ -inches thick and 30 inches long; front hound is 1 $\frac{1}{2}$ -thick by 54 inches long; bottom slides, 1 $\frac{1}{2}$ -inches thick, 3 inches wide, 54 inches long, to be left full in the center. The reach is scant 2 by 4 inches by 8 feet; back hounds are 1 $\frac{1}{2}$  by 56 inches long; axles 3 by 4.

bottom boards and 8-inch top boards. That is on the 2 $\frac{1}{2}$  wagons. The wheels should be 3 feet 8 inches and 4 feet 6 inches with 1 $\frac{1}{2}$ -inch tread, 7 by 9 hub and 2-inch and 2 $\frac{1}{2}$ -inch spokes; sand boards are 2 $\frac{1}{2}$  by 3 $\frac{1}{2}$  by 4 feet long; wagon box cross-timbers, 1 $\frac{1}{2}$  by 2 $\frac{1}{2}$ , the front one being 44 inches long while the two center ones and the back one are 50 inches long, so as to support the braces. I always put the front strap bolts inside of the box and the four center and two back ones on the outside of box. The factories put them all

of the best quality. For making the reins, take a sufficient length of  $\frac{3}{4}$  or  $\frac{1}{2}$  by 4-inch iron to form a band that will easily pass down over the tool to be caught in the hole. If the band is about  $\frac{1}{8}$  of an inch larger than the upper end of tool, it will be about right. Having secured the proper stock the next step is to chamfer one edge of the iron for the band. See A in the engraving. This chamfered edge is to form the lower edge of the socket, so as to go easily over the top of the tool when let down into the hole. Scarf the ends for welding, or better, scarf only one end at this stage of the operation. Next take a 1 $\frac{1}{4}$  or 1 $\frac{1}{2}$ -inch fuller, and fuller out two tapering ways (for the slips to draw in)  $\frac{1}{4}$  the distance from each end of the stock, making the ways  $\frac{1}{4}$  or  $\frac{1}{8}$  of an inch deep at the upper edge of the band and running out at about  $\frac{3}{4}$  of an inch of the chamfer. See B. Now weld the band and scarf for the reins, bringing the tongue of the reins down over the outside of the band as far as necessary to make a good strong weld. Refer to C in the engraving. Before welding on the reins, their upper ends should be upset so as to strengthen them where they are welded to the pin.

Now dress up the stub of the pin and weld the upper end of the reins to it, taking a good lap on the welds, as shown at D. You are now ready to make the slips which fit into the ways. These should be made of good tough  $\frac{3}{4}$  by 1 $\frac{1}{2}$ -inch tool steel. Spring steel will do, however, if care is taken in working it. These slips are simply wedges having teeth on the face and rounded on the back somewhat like the back of a spoon. They are welded to a bow of light stock;  $\frac{3}{4}$  by  $\frac{3}{4}$  or  $\frac{1}{2}$ -inch tire iron is about right, although I have used  $\frac{1}{8}$ -inch round to make the bow when nothing else was to be had. The length of the bow and slips should be such, that when pushed up in the crotch of the socket at M, the points of the slips will still be in the upper part of the ways. When in place, the upper teeth should be set a little closer together than those at the point. In the ways, they bite first and ensure a firm hold when set on the tools in the hole.

At a point a little over 4 inches below M, drill a  $\frac{3}{8}$ -inch hole through both reins as shown at N, and make a pin that will reach through. Now put in the slips, then the pin and then batter the ends of the pin slightly so that it cannot work out. The slips should not be tempered too hard or they will break, something like a saw temper will do. Grease the



HOW TO MAKE A SLIP SOCKET AND SLIPS.

You get their length as follows: in the rough they are 6 feet long, but to get the finished length correct you should take the distance between the shoulders or collars of skeins and then take the distance from butt of hub to front of spoke. Now double this and subtract from width of track. To illustrate: suppose the distance from back of hub to front of spoke is 7 $\frac{1}{2}$  inches, this doubled is 15 inches which when subtracted from the width of the track (say 62 inches) leaves 48 inches between shoulders on the skeins.

We use wide track in this part of the country. Bodies or boxes are 42 inches wide and 10 feet long with 14-inch

inside, but I get better results by putting them as above. I think the sawed felloe far superior to the bent rim for farm wagons. In driving spokes in the hub, never dip them in oil or paint as oil never wants to be put on a tenon. Use cement of some kind or a good glue. The selling of a job lies in the finish of it and to finish up a job well you must have it good from the start.

#### How to Make a Slip Socket And Slips.

L. R. SWARTZ.

The stock required for making the lower part of the socket is 5 $\frac{1}{2}$  feet long of  $\frac{3}{4}$ -inch or  $\frac{1}{2}$ -inch by 2 $\frac{1}{2}$ -inch iron



ways well and have them nice and smooth. The tool will go down over the iron, but on coming up the teeth take hold and drag the wedges into the tapered ways, which causes the teeth to bite into the soft steel or iron, making a hold that will not let go. Long stroke jars are needed with this tool.

### A Short Talk on Hardening Cams.

DAYTON O. SHAW.

When hardening cams I think it well for the beginner to know the causes for steel cracking or going out of shape. I allude to articles that are left hard and the temper not drawn. If you put a cam into the fire and heat it any old way and then harden it in a cold bath, perhaps it will come out all right but the chances are that it will be all wrong.

What makes steel crack or go out of shape? There may be a strain in the steel when it is brought to you to harden, or an over heat, or an uneven heat, or the blast may strike the steel when it is hot, or a cold bath or strains in the steel after hardening. Now, to be sure what you are doing from start to finish, you must overcome these difficulties. Machinists are always in a hurry for their work, but no matter how much they crowd, do not put any work into the fire until you are ready. The first thing to do when cams are brought to you to harden, is to put them in boiling water for a few minutes to remove strains. Next warm your brine to 70 degrees. Then take your cams from the hot water and lay them on your forge. Then fix your fire. Have it clean, high and dry and run a light steady blast. Put your cams into the fire and since it is high up from the bottom, the air is burned out before it reaches the steel. To get an even heat, keep the cam moving all the time it is in the fire, turning it over and over until it shows a low dark red, then plunge it into your bath. Let it remain here until it stops singing, then remove it to the boiling water bath, let it stay in this for a few minutes and the work is done.

Some claim that cams which have been once hardened are likely to crack if hardened the second time. We had some cams brought to the shop to be dressed over. To anneal I heated them in sand to prevent scalding and in this way some cracked at a low heat. Now the cause was not in the second hardening, it was in the first. The cams were first hardened and put into the machine without the strains being removed and when they required dressing over and were heated up, they simply "let go." Steel may be hardened over many times if you treat it properly at the start. I have in mind an experimental cam, it was a small thing but was a days work

same height inside and outside at the rear quarter. But bear in mind that the hind foot of a horse is from  $\frac{1}{4}$  to  $\frac{1}{2}$ -inch longer on the outside than on the inside. Therefore fit the shoe so as to throw the weight on the inside front quarter, to balance him up. My method is to dress the foot perfectly and then if necessary weld the toe calk  $\frac{1}{4}$ -inch outside and give the outside heel an out curve of 35 or 40 degrees. This will throw the weight back on the inside front quarter and he will travel wider and will forget all about interfering.

It is a very easy matter to pare a horses' feet so he will travel wider. Young smiths should take notice of this for it's very important to all beginners. When the foot is not level, it throws a strain on the coffin joint. Inflammation then sets in and the horse usually goes lame.

Contraction is caused by inflammation which in turn is caused by improper shoeing. The shoe is set so that it pinches the foot, the pores close and the glands that moisten the foot dry out. When the foot becomes dry, the heels curl in. To cure this, fit the shoe and bevel the outside of both heels from the rear nail to the heel on the outside  $\frac{1}{4}$  of an inch. This will allow the foot to spread when the horse puts



PRESIDENT ROOSEVELT'S RIDING HORSE "BLEISTEIN."

for a man to finish. There were thick places and thin places, square corners and drill holes. The inventor had to change it over many times before he got it to run perfect. I have hardened this cam over five or six times with good success by being careful to remove the strains each time before hardening and after hardening.

### The Cure of Lameness and Contraction.

C. W. METCALF.

Did you ever see a horse interfere when properly balanced? Of course not. Some smiths take a well-balanced horse, shoe him and make him interfere and then don't know why the animal interferes. If the foot is well-balanced and the shoe fits properly, he cannot interfere at all. His feet must be the

his weight on it. Some people use a bar shoe because they were taught that method, but I find it unnecessary to use a bar shoe for contraction and there are but few cases where a bar shoe is needed. I have not set more than 4 or 5 bar shoes in the last ten or twelve years.

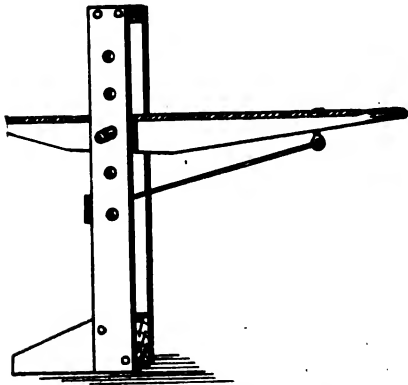
### Running a Blacksmith Shop.

GEO. W. TINKNEY.

Since last April I have worked for cash and it's the only way to run a business of any kind. People get so they don't ask for credit just the same as buying a railroad ticket. I have been in my present shop over seven years and enjoy a good trade. I do shoeing and repairing of all kinds. My prices are; new shoes, 30 to 40 cents per shoe; re-setting, 20 cents per shoe; wagon axle,

\$2.25; tongue, \$1.50; spokes, 10 cents; rims, \$1.00 and up according to size; resetting buggy tire, 40 cents; light wagon tire, 40 cents; heavy and wide tire, 75 cents. But it is not so much the price as it is, "Do you get it?" I hope the day will come when we will have a cash business all through the world.

Some smiths say not to rasp the outside of the horn. That will do where the foot is straight, but there are no two feet alike and it would be anything but a good foot if the rasps were not used where the hoof grows too fast. There are more feet ruined by not paring and rasping the sole of the toe to a natural shape than by rasping on the outside. Where the shoes are toe-clipped and set forward, it makes the toe long and wide and draws the heels in until there is



A HANDY WAGON JACK.

scarcely any place for the heel nail. The shorter the foot the wider the heel will grow. Let the horse run without shoes and see how short the toe will get before it wears to the quick and the foot will get lame in the heel first.

#### A Handy Wagon Jack. HANDY ANDY.

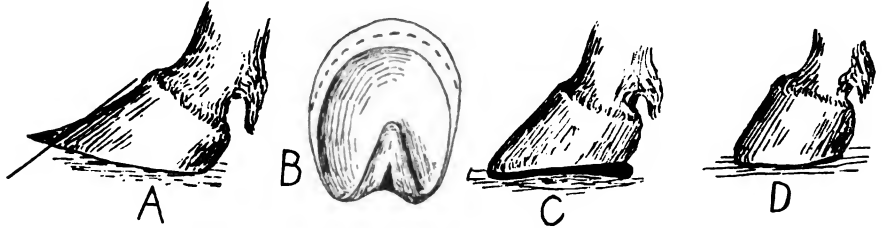
The accompanying engraving shows a wagon jack which is cheaply and easily made and is very powerful. Take for the uprights, slats of pine or other light wood, 3 inches wide by  $\frac{7}{8}$  of an inch in thickness and 2 feet 10 inches in length. Frame a block with tenon and bolt at bottom and also a small block at top one inch in thickness. Then make a wooden lever as shown and fasten a rod with cross piece and the jack is done. By pressing the lever down the cross piece on the rod drops down and firmly holds the lever in position.

#### How to Prevent the Horse from Forging.

A. N. WELLS.

One of the most common things we have to contend with in horse shoeing and one of the most troublesome is forging. For the benefit of the craft, I will give my way for preventing it. The

accompanying engraving A shows a front foot that is prone to forge. The heavy line shows the surplus horn or wall at the toe. At B the bottom of the foot is shown. The foot is cut back to the dotted line until it looks like C. Fit the shoe as round at the toe as possible.



HOW TO PREVENT THE HORSE FROM FORGING.

ble and with a high heel. A swell heel is preferable. If you put on a toe, make it very low and place it well back on the web of the shoe. The toe of the shoe should be rolled a little. We always use toe or side clips in California, but some smiths don't turn them on a shoe like this. At D is shown a hind foot that has forged. The heel should be cut down as much as possible and the shoe fitted full at the toe. Put on a  $\frac{3}{4}$ -inch square toe calk and thin the heels down for about  $1\frac{1}{2}$  inches. I have found this method very successful in the worst cases.

#### An Unusual Case for the Shoer. FROM SAWYER.

The accompanying engraving shows the shape of a horse's foot which I have been shoeing for two years. This condition was caused by founder and neglect of the feet. When the animal was brought to me, the hoof was so badly broken that I could hardly get the nails to hold. I had to put six nails in each

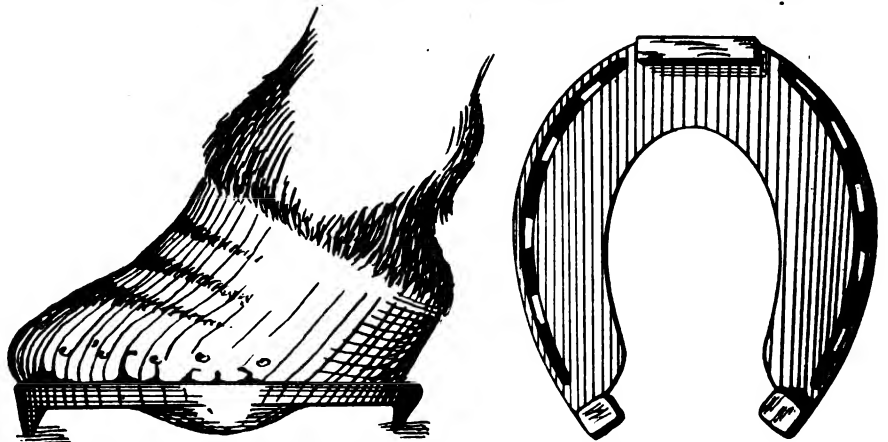
possible. I then put high toe and heels on the shoe so as to keep the middle of the foot off the ground. You will notice that the sole is below the shoe and will not stand any bearing. This horse is working every day and seems to do very well by this treatment.

Should any brother have another method of treating this trouble I, and also the other brothers, would be very glad to hear about it.

#### Shoeing a Horse That Interferes in Front.

M. L. CHUNN.

I have in mind the shoeing of a horse that interferes in front. I will state just the shape of the horses feet and give my remedy and a few pointers on shoeing that I never have seen in print. The horse I have in mind stands a little toe wide, and in moving when he puts his weight on one leg, the ankle springs in and he strikes that ankle with the other foot about at the second nail from the toe. The only remedy I have found is to keep the ankle from springing when moving and I do it this way: I take an ordinary shoe that will fit the foot and turn the inside calk extra high and outside extra low. I fit the inside of the shoe full, giving the last quarter at the inside of the shoe as little bend towards the frog as I can, and the outside I fit as



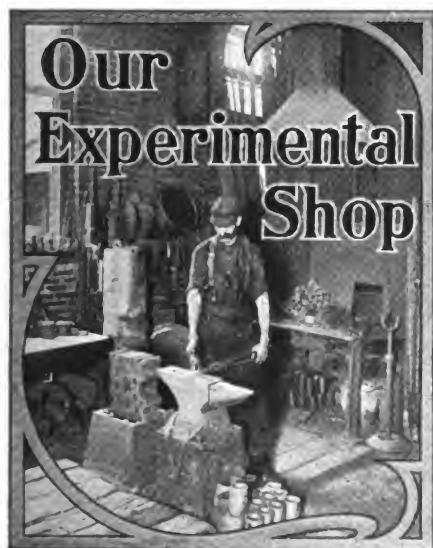
AN UNUSUAL CASE FOR THE SHOER.

side before the shoe would stay on. The sole of the foot has dropped at least one inch below the wall of the foot and is shaped like a half ball. I use a number six shoe, and shape it to the bottom of the foot as closely as

close as possible. This will hold up his ankle. Then make the inside of the shoe at the second nail from the toe, just a little straight. There is one thing to be watched very carefully in making the inside of shoes straight and that is, if

this cures the interfering and you continue it and you don't watch, you will have more hoof on the outside than you have on the inside, and when you get a foot in that shape you have a bad case on hand. I always take the frog of the foot for the center, and in shoeing the horse I have in mind, I aim to grow more hoof on the inside than there is on the outside. And as you grow the hoof this way, you can bring down the inside calk and raise the outer one. When you get the foot in the proper shape you can then shoe him level and he will go all right.

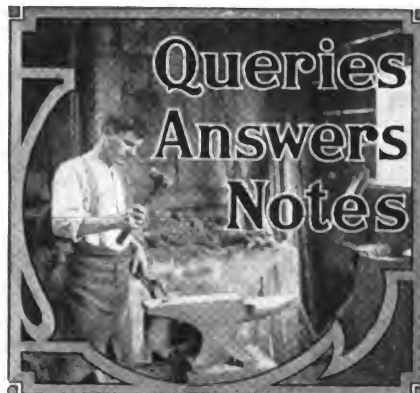
When a horse comes to be shod, look at his limbs and feet. If his feet are not straight, just imagine how his foot would look with a shoe on and the foot straight, and when you get the picture in your mind all right, then go to work and make your shoe to fit the picture. You cannot imagine whether it will take a light or heavy shoe, but you will decide that, by what the owner tells you about the way the horse travels. Of course, you cannot use the imagination when you have no shoeing to do, you must see the horse's feet before you can draw the picture in your mind. It is said that the man who invented the sewing machine looked at a pile of scrap iron and then imagined how it would look in a sewing machine. He then went to work and made a sewing machine. It is just so with horseshoeing, when you see the horse, look at his feet and if they are out of shape, you can use your imagination.



Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

Break high carbon steel by nicking at the desired point and giving it a sharp blow cold at the anvil. For cutting iron, the modern shears and punches are so useful and inexpensive that no shop is well equipped without one.

The painter has experienced no little trouble by occasional requests from the repair department for "Just a dash" of some color for an old spoke or felloe. The boss remedied this by placing in the repair department, small cans of the most used colors. This does away with the necessity of running to the painter every time a "dob" of color is needed, and it also saves the painters time.



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**A good simple fifth wheel.**—I would like some brother smith to tell me how to make a good simple fifth wheel of rod iron for buggies.

CHAS. PAUSTIAN.

**Polishing and Finishing butcher knives.**—Will some brother smith give a method for polishing and finishing butcher knives such as are on the market? J. L. WETZLER.

**A Question on Horse Stocks.**—I am thinking of putting in a shoeing rack. Will some brother please tell me if they have ever used a Barcus rack and also if it is the best? W. E. MARKS.

**Tempering Automobile Springs.**—Please let me know through the columns of your paper, the best way to temper carriage and automobile springs, where a forge only is to be had.

EDWIN A. WOLFF.

**Wants to make a plating battery.**—I shall be obliged to one of our brother blacksmiths if they would let me know how to make a battery for gilding purposes and the quantity of material used. G. A. CARTER.

**Has trouble with babbit.**—I would like to ask through the columns of the AMERICAN BLACKSMITH the best way to babbit boxes. I have some trouble in that line especially the heavy ones as the metal stalls before it gets all around. JACOB VERRIPS.

**Tempering steel springs.**—I would like to know how to temper  $\frac{3}{8}$ -inch round steel for springs. What kind of steel would be the best? The accompanying engraving will show you the kind of spring I mean. What would the tempering solution cost? M. WILDBERGER.

**That Painting Question.**—The man who said the paint shop did not pay—I would like him to answer a few questions. How do you paint a buggy—i.e., under what system? How many coats of paint and how many coats of varnish and what is the price charged—kindly name the vehicle, brother? M. L. CHUNN.

**A peculiar case.**—I would like to know what to do for a two year old colt I have. He seems to be all right in every way, only when I take up his hind foot and trim it or

shoe it he will go lame for sometime after or after a drive he will show a little lameness next day. It hurts to bend the foot back in position to shoe it. R. A. CALHOUN.

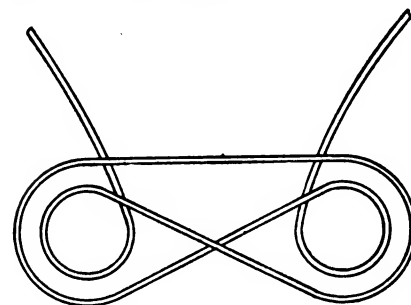
**Two questions by an English brother.**—I am working at a livery, and eight of uor horses are running the mails. They have to travel at a good pace which makes one of them interfere very badly behind. He is inclined to be toe-wide and knocks with the heel. Could some brother smith advise me through our paper as to the best way of shoeing him? I shall feel very much obliged to them if they can.

I also have trouble with the feet of some horses that are worked very hard and consequently they get through iron  $1\frac{1}{2}$  by  $\frac{1}{2}$  and 1 by  $\frac{1}{2}$  in 6 to 9 days. Is there some way in which I could harden the iron so as to last longer. BETHUEL H. JONES.

**Cast iron rings best.**—In answer to brother Carl A. Gillen will say, the best rings for his steam hammer are of cast iron. Use plenty of good cylinder oil. If J. A. Simmons has power in the shop and furnishes all material to do the work, will say  $\frac{1}{2}$  the profit is sufficient remuneration, but if a man has to do the work by hand  $\frac{1}{2}$  is none too much. Dixie Land also has something very good to say in the November issue. E. A. BARNARD.

**A note from Missouri.**—I am a young smith, 25 years old and have received many a good hint from "our" paper. I do all kinds of blacksmithing and repairing and also horseshoeing and do painting as a side line, as there is not much money in the painting alone. But if a job is brought to be repainted you will always find something on the job that needs repairing and of course the customer pays well for that, so I do get good money for the job after all. THE MISSOURI KID.

**Trouble with Interfering Front.**—I have a horse that interferes both front and hind. I have shod him twice and succeeded in stopping him behind, but I would like some brother smith to give me some pointers about his front feet. He is toe-wide and travels wide when trotting, but strikes when walking. If any reader has had experience in such a case, I would be glad to have him answer in the next paper.



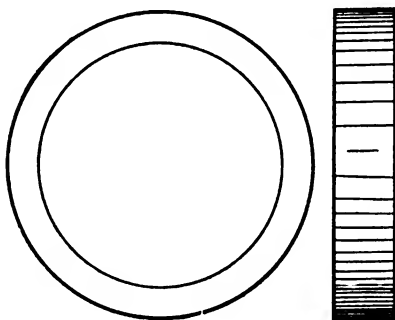
TEMPERING STEEL SPRINGS

I think THE AMERICAN BLACKSMITH is the best trade paper out, and I don't see how a man can get along without it in his shop. GARNET F. ROWE.

**Best Steel for Cutting Chilled Rolls.**—In regard to inquiry of Mr. W. M. Champion in your last issue, asking what kind of steel to use and how to harden tools to cut chilled rolls for rolling iron, I wish to state that I use Blue Chip and ordinary tool steel and find them very satisfactory. In working the Blue Chip, I heat it to a yellow heat and forge the tool, after which I leave it cool off

in a warm place. After it is cold, I have it ground to the proper size and shaped. For hardening the tool I get it to a white heat or until it sweats or runs, then I put it in a cold blast. In hardening the ordinary tool steel, I sometimes dip the point in potash or use a mixture of one part sal-ammoniac, one part borax and 3 parts potash. I find this very satisfactory. GEO. MOSLENER.

**To Find Circumference of Bands.**—I noticed in December's number of THE AMERICAN BLACKSMITH an article or a rule for finding the circumference of a band or circle. It is a very good rule, but I think I have a better one to give my brother smiths. It



TO FIND CIRCUMFERENCE OF BANDS.

is one that is used by all machine forgers. I have used it for years and find it "Oil Kor-rect". For example, you get a band to make as shown in the engraving. Add one thickness to the inside diameter and multiply by 3.1416. 8 inches + 1 inch = 9 inches  $\times 3.1416 = 28.2744$  or about 28½ inches, and you allow for your weld, about one-half the thickness of the iron. ISADORE H. DUBE.

**How to Make a Grub Hoe or Mattock.**—Take common tire iron about 2 by ¾ (I use the short ends which are cut off new tires) and 12 inches long, and split this edgewise with a sharp cutter and a little nearer one end than the other. Have an eye-wedge the exact size and shape you wish the eye. Then spread the split with a taper punch, and insert your eye-wedge from the back and work the eye out over the wedge, having the back side of the eye larger than the front. When you have finished the eye, forge the ends in the shape you wish them and lay with cast-steel. After a little practice a smith can make a good hoe in a very short time. H. L. KIBLER.

**A Plea for Fair Play.**—Having read with interest the many articles in former issues of your magazine, I have been thinking how much some respect the rights of others, while some only care for themselves. For instance a smith buys of a jobber, who sends net price catalogues to his (the smith's) customers without the smith knowing it, until he has purchased several hundred dollars worth of goods. When a customer asks the smith's price, which very seldom is more than enough to cover expenses, the customer pulls out a catalogue from this same jobber and says I can get so and so for so much. Where do these jobbers protect the smiths who feed them or, in other words, keep them in business? I believe blacksmiths and wheelwrights should be protected by their jobbers and when a smith finds that his jobber is posting his customers

on the cost of the materials he buys, he should quit him forever and tell his brother smiths about it. I would like to hear from other smiths. JOHN W. RUSSELL.

**Mercury for Hardening Lathe Tools.**—Can you or any one of your numerous correspondents that are wise to the craft, tell me through the columns of THE AMERICAN BLACKSMITH how to use quicksilver to harden lathe tools? For instance, how much is necessary to use to give good results and is there any danger in its use? I understand that its use gives the hardest temper of any known substance.

I have been quite a little interested in the remarks of your correspondent from the "Kansas Wheat Belt," Walter McCoy, on page 55 of the December number of THE AMERICAN BLACKSMITH. I wonder if he couldn't be prevailed upon to give us a sketch and description of the power hammer that cost him \$12.00. My! My! sharpened 50 shares and pointed 7 and in less than a day. No telling how many more he could have done could they have gotten them into the shop. Make new plow share (how many?) in 30 minutes. Decidedly timid I should say. Well! Well! I have had about 60 years experience in the business, but I think I must always have been a little slow. Shake, brother McCoy and come again. A. G. WOODWARD.

**A Good Talk From The Sunny South.**—I have a small shop in the country 36 by 20 feet in the midst of a pine timber region in Louisiana, where a great deal of logging and other business, as well as farming is carried on, all of which gives me plenty of work. My brother has a general gun smithing department in connection with my shop and he does most any and everything that comes along, in fact, we fill the demand in general and do everything except horseshoeing. I have been in the business only eight years with some previous experience as a helper in my father's shop when quite a lad.

I do good work and put a reasonable price on it, both of which points are good in keeping old customers and gaining new ones. I believe in power in the shop, and although I have not yet installed power, I expect to in the future. I believe in advertising, in being prompt, kind, and pleasant to all. As to whether the paint shop pays or not, I think it depends mostly on the conditions of the smith, i. e. the amount and kind of work he has to do. If a smith has plenty of other profitable work, I do not believe it would pay him to use his time in the paint shop. If, however, a smith be able to do all the other work and find time to do the painting, he can do so at a neat profit. I am of the latter and find it at least profitable enough to continue to do painting. My side line is a small farm, which affords much pleasure and profit. I take great delight in blacksmithing and am always ready to try something new and learn. Work is a pleasure and although I am not so well "fired up" as some of the brothers, my courage never fails. H. HUSSER.

**From the Far Away North-West.**—I feel convinced that much good can be done to the trade in general through a healthy journal like our AMERICAN BLACKSMITH, if only we could get all branches of the trade interested, both master and men alike, be-

cause one cannot do without the other. Each is equally necessary for the benefit of the trade.

I like your remark upon the apprentice question and I find that the same thing applies in Old England. In the course of time I am afraid that a good general blacksmith will be of great value, both in this and other countries. I think it would be a fair idea if the American Blacksmith would try to find out through subscribers, how many apprentices there are to each man employed, how many men, who are taken, have not been at the trade four years, the general rate of wages paid and the rate of hours worked on the average per week. I think it would be interesting and likewise be the means of finding out the reason of so few apprentices. I am often surprised at the cheapness for which the general blacksmith works. I do not think there is another man who works so hard and receives so little and gets more abused, than the average blacksmith. And I do not feel that we generally give that respect due to each other. We often treat our brothers as if they were only Tom Tardy's and sometimes I wish that I could be a little like Tom, so as to enjoy life, and like him, be able to lay my hammer down and give nature a chance. A few days pleasure would often build us up a bit better. Tinkering from one year to another is monotonous and, to say the least, not life, but the majority of blacksmiths enjoy life that way. J. E. WRIGHT.

**A very Interesting General Talk.**—I have a House Cold Setter No. 2 and I think it the best. The principal is what I go by. I am in a rented shop, one story 20 by 50 feet, no outside room to speak of and am very badly cramped for room. Keep one all-round-man all the time. Have bought a 10-horse Gemmer gas engine and expect to have it running by spring with natural gas. One thing we have to contend with here is low prices: \$1.20 for 4 new shoes; resets, 20 cents each; light tires, 50 cents each. 2½-inch tires, 75 cents each; spokes, 15 cents each; light rims, \$1.00; 3-inch rims, \$2.00 each; axle trees, \$3.00 each; tongue \$2.50 and for ordinary repairs I charge 40 cents per hour. This price, however, knocks me out of lots of work, but nevertheless we are busy all the time. We build new work to order and are now working on our sixth wagon since last January. We never solicited for any but one of them. We put up nothing but the best, for I think that pays in the long run.

Will say also that about a year ago some of the older smiths in our town undertook and did organize an independent Union. The promoter of the organization said that if a certain smith in town was allowed in the Union he wanted nothing to do with it and as he never came to see me, I took it for granted that I was the man. The reason for this was, I started in business about one year before the organization and my work was telling on his business, although I was not cutting prices I having to make my own as no one would tell me what their prices were. In closing, one word more, the Secretary of that Union, about 5 months ago, hired out to run a man's shop where they now shoe horses all round for 80 cents. We boast 2200 population. R. M. WHITE.



**A Letter from Kansas.**—I would like to ask through the columns of THE AMERICAN BLACKSMITH where Mr. Walter McCoy is? He says he is in Kansas, and as I am a resident of the "Sun Flower State" myself, I would like to know his town. I would like to see him do some of that swift work he tells about in the December issue of THE AMERICAN BLACKSMITH. I have prided myself some on fast work, but brother McCoy has got me "skinned" a country block if he puts on the kind of plow points that I do. But, of course, he does not, for I use  $\frac{3}{4}$ -inch by  $1\frac{1}{4}$ -inch stock to make my plow points and I would like to see any man put on a good point and get it ready to sharpen in 20 minutes. I would also like to see brother McCoy or any one else, make a plow lay from blank stock, fit well and do a good neat job on it in 30 minutes. I think Brother McCoy must use the ready-fit lays. I would think his plan of cutting and welding tires, instead of taking two inches with the shrink, would be a time killer, for I can upset an ordinary tire from  $\frac{3}{4}$ -inch to  $1\frac{1}{4}$ -inch at one heat. Buggy tires if very loose, should be upset on each side of the joint boltholes, therefore, I prefer the upsetter. I have a 4 H. P. Witte gasoline engine, a Little Giant Hammer, an emery stand, a power drill and also run both of my fires by power, but I cannot do work as fast as brother McCoy can. I will now leave the subject up to him.

In regard to cold tire machines, I will say for Mr. J. F. Williamson's benefit that I am using the Brook's Cold Tire Setter and would not dispense with it at all if I could not get another of the same kind. But with a Brook's as with anything else, you must learn how to use it and don't find fault with the machine if it won't tighten loose spokes and do other work. It is not made to do anything but upset tires and that it will do and do good. T. S. HOLLOWAY.

**Several Pointers on Drills and Drilling.**—Replying to the questions in regard to shape of drill bit, beg leave to submit the following practical method. As the question did not state the kind of drill used, it is presumed it is the ordinary square bit common with well drillers. I will endeavor to describe my method of forging and tempering that kind of drill bit. Using a "hollow fire" heat the steel slowly until you have the proper forging heat. Now place the drill bit in a vertical position, socket end on the ground with cutting end against anvil. Now upset the drill bit with sledgers until you have the proper gauge, then trim with hot cutter, if necessary, until you have proper shape. When extreme hard rock is to be drilled, use the following receipt for a tempering solution when extreme hardness is required.

The object in using chemicals in hardening and tempering is because of their tendency to retard the formation of steam and other gases which allow the steel to cool rapidly. Where extreme hardness is required the following solution will be found effective. Dissolve in this proportion in rain water—to two gallons of water, add  $1\frac{1}{2}$  ounces of common salt, 1 ounce of saltpetre, 1 ounce of sal-ammoniac and 1 ounce corrosive sublimate. The larger your steel the greater quantity of solution required. As this solution is poisonous, don't inhale the fumes or gases.

Now heat the drill bit to a dull red, plunge it into the bath and allow it to remain until cool. If you are careful in heating, the bit will drill the hardest rock.

In regard to caving in, it is presumed not desirable to use casing further down than the rock, so I would suggest using a larger casing until the rock is reached. Now drill into the rock until you pass the quicksand or other formation that caves in, then let your casing into the socket formed, then use a smaller drill to finish the hole. Well drillers here follow the drill to the bottom of the hole with casing. J. C. LAMONS.

**The Weight of Tires Governed by Rim.**—I am a government wheelwright and the practical experience I get in this line is very much limited, as our vehicles are not a very large assortment. I will first tell you about my wheelwright shop. It is 26 by 36 feet and is equipped with one circle saw machine, one band saw, one hub borer, one tenoning machine, one turning lathe and a good set of bench tools. The prices in this section are much in excess of those in the east, but the profits are about the same after all, as freight shipments are very expensive, and the cost of living is very expensive. I will give you some prices as far as I have been able to learn.

Shoeing per team, plain shoe....	\$4.00
Wagon tongues \$5.00. Complete	
with hounds .....	7.00
Wagon axle wood.....	5.00
Spokes .....	25 to .35
Cross bar in buggy shafts.....	1.50
Wagon reaches each.....	2.50
Bolsters each. ....	3.00

I have read many articles on tire welding and setting, but have not see anything yet on the weight of tires, or the proportion of tires, that is, the tire being proportioned with the rim. Some people seem to have an erroneous idea that the heavier the tire the better the wheel. This is not my idea of what it takes to make a good wheel. I think the tire should be in proportion with the rim. If the rim is  $1\frac{1}{2}$  by  $2\frac{1}{4}$  inches the tire should only be  $\frac{3}{4}$  in thickness. While I have seen tires on rims of this size  $\frac{3}{4}$  of an inch in thickness, I don't think that such heavy tires should be put on as light a rim, as the rim will not stand. I have worked in the mining countries where the flint rocks would wear out a tire like an emery wheel. I have taken off old buggy tires that were worn as thin as hoop iron on edges, with just a little oval in center. I have seen a  $\frac{3}{4}$ -inch tire put on a 1 by  $1\frac{1}{4}$ -inch rim, and spoil the wheel, when in my opinion a  $\frac{3}{16}$  inch steel tire would made a good job.

I would be glad to hear from some of the other brothers of the craft on this subject, and think it should have more consideration in the future than it has had. M. A. FOSTER.

**How to Weld Channel Tires.**—In your query columns, John P. Faulstick and A. S. MacDonald, asks about scarfing and welding channel tires. While I have done very little of that I have had very good luck with what I have done. Scarf them similar to any tire by flattening the channel is one method. Have a tool made to fit in the hole of your anvil and 5 or 6 inches long to fit your channel for a form. If you weld it flat, bend it over this form afterward. It can be done by scarfing in its natural shape and weld it on the form. However, it is

difficult to prevent burning the edges. I would use borax. Have plenty of good coal on your fire and have the fire as clean as possible. Have tire as near the size as possible as it is not easy to stretch.

J. F. Williamson asks what is the best cold tire setter, and some one else asks about the same, says he is in doubt about the quality of work they do. I have had similar doubt, but have just purchased a "Schau". cold setter. This is the rainy season in the Golden State and I have used it so little that I am unable to give any intelligence on its merits. This machine is one that you put right on the wheel without taking the wheel off the buggy. If the spokes are about all loose, you take all the bolts out, except one at each joint to proposittee each other. Knock the tire off, one half will be inside and the other half outside the wheel. Now you can wedge all the spokes and cut out at the joints, if necessary, for the wheel must not be left rim bound. A hack saw is good for this purpose. Now put in all your bolts. In some cases you might have the two out at the joint till you upset the tire. Watch the dish while you upset and hammer the rim to ascertain when it is sufficiently tight. Good judgment must be used. In case you get one too tight, you might be able to stretch a tire with the machine. I never tried that. I hope to be able to make a full report on the results of my experience along this line later. I have an "Ideal" hot shrinker which is hard to excel in some ways. But I must beg pardon for this long letter, I did not intend it. My only excuse is that THE AMERICAN BLACKSMITH is so very interesting and valuable that when I get to reading and writing for it, I can hardly stop. Am neglecting other important work. J. M. FIX

**How I Started in Business.**—Seventeen years ago I built a small shop, 18 by 24 feet, got a small anvil and a bellows, together with a few smaller tools, amounting in all to \$42. My first bill for stock was purchased at the nearest hardware store, nine miles distant. For this I agreed to pay within thirty days \$7.08. I carried it home on my back and hung out my shingle. Since that time I have not carried my supplies on my back, but I have never been able to get any great amount without having it charged, owing to the fact that my customers are using my money. The word "Trust" is disgusting to me whether in the shop, or of the New Jersey kind. Since I began, I have in some way enlarged my shop to its present dimensions, 30 by 36 feet, two stories high and added many modern and useful tools, a blower, a Western Chief forge, a drill, a set of Little Giant screw plates, a Silver's band saw, a shrinker, a bender and other smaller tools too numerous to mention. I am looking forward to the day when I can install a gasoline engine.

My side line is boat building, something I have not seen mentioned in connection with blacksmithing. I build with the aid of two men (one of which I employ the year round) from ten to fifteen boats, ranging in price from thirty dollars to seventy-five. I issue a catalogue which thoroughly describes them. Besides this, I am agent for harvesting machines, plows and all farm tools and machinery, and keep a good stock of hardware. I build wagons and sleighs and, in fact, any and everything that is

brought to my shop. I keep a good stock of material for repairs. Have a place for everything and keep everything in its place. I find no time to play nor fish, nor have I any use for the saloon and after I have completed my 25 years, which is long enough for any man to shoe horses, I expect to take up some easier occupation. Would like the presidency of some Life Insurance Company. This appears to be a very lucrative position. Then I could maintain a lobby at Albany and force through that blacksmith lien law. In the meantime, I shall continue to read THE AMERICAN BLACKSMITH. From it I have gained much useful information, and while I cannot agree with everything therein, on the whole it is worth many times the price to any blacksmith (useless, perhaps, to the one who knows it all). Every blacksmith can find in its pages something of interest to him. I would like to hear from those using shoeing stocks, whether or not they are worth the price to the ordinary shoer who has a limited amount of shoeing.

JOHN F. BUYCE.

**An Interesting letter from Ohio.**—The November issue had many good things in it. Dayton Shaw says well, when he condemns withholding information that would benefit the craft. I am only too glad of an opportunity to help my brother if he is willing to accept it. Three years since I worked at woodwork for a smith that did not know very much, however you couldn't make him believe it. One of his customers brought in a machine sickle wanting some new sections. He went to work with cold chisel and punch, rough as could be bending and knocked it all out of shape. I asked him to let me have it a moment, which he willingly did. I fastened it in the vise, back up, hit a good blow on the back edge of the section over the rivet. One more blow and off it came. And so on till all were off. He looked foolish yet pleased. In a few days he had another brought in and as sure as you live he went at it his old way. Of course I had no more information for him.

Two years ago our county organized. The same fellow went in and in less than a week broke his obligation and killed all the good done. He knew very well he could never succeed on his merits as a mechanic. What can we do with these "pick-ups" who get a cracked anvil and a leaky bellows and start out without system or knowledge, satisfied to make a dollar or so a day. License law is what we must have.

Our apprentices come largely from the sons of blacksmiths. I have three sons, one of them is a mine smith and receives three dollars for a day of eight hours. I would like to teach the youngest boy, now 19, the trade but to do so and send him out to compete with the above class of men, I feel would be doing him an injustice. Good honest work, honestly done, is the fair thing. I worked five years under a man who would not allow a job to go out of his shop till it was finished in every way as good as it could be. His motto was. "A job that is worth doing, is worth doing right."

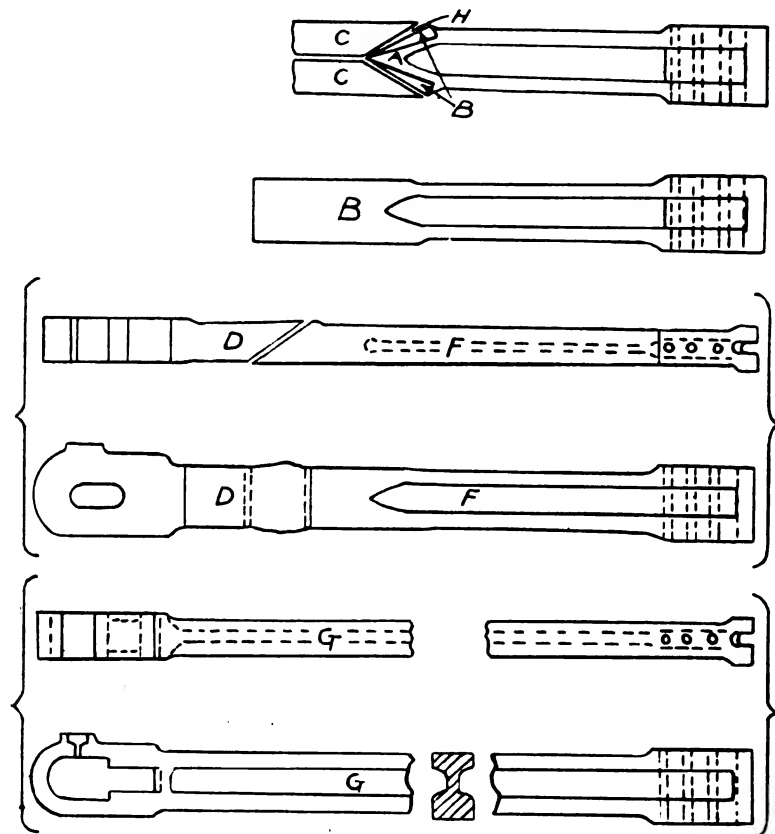
The Apostle Paul says "Prepare things honest in the sight of all men." Our trade is a difficult one. A good eye and good judgment is everything. Why anyone should think for a moment that our trade

is a lowly one I cannot conceive. How long could the business of the country run without the blacksmith? I am proud of my calling. The good mechanic does not work on a "cheap John" scale. He is the man I love to take by the hand and call him brother. He is the man who takes and reads his trade journal. The other fellow don't need it. I would like to hear from more of the craft through the AMERICAN BLACKSMITH. T. J. WALLACE.

**Locomotive Motion Rods.**—Recently the Southern Pacific Company has been changing the heavy compound engines to straight engines. It became necessary to lengthen the main steel connecting rods; this is accomplished by welding on new ends. The original method as explained was not satisfactory. I adopted the method as shown in diagram 1, 2, 3, and 4. We cut off the end that has to be renewed. The end of the old portion of the rod to be welded by up-

ping heat in separate fires, welding them on to the surface B B, under the steam hammer. Another welding heat is now taken for the purpose of forming a perfect union of all of the parts as shown at B. figure 2. The remainder of the work is done by the ordinary method of lap welding under the steam hammer as shown at D-F. figure 3. The portion D is forged by the steam hammer, forgings from the best scrap iron obtainable. The rod being finished as far as the forging is concerned, goes to the machine shop to have the new iron portion finished and grooved as shown at C-G. figure 4. When the rod is being finished in the machine shops, the slightest defect in the welded portion will be discovered.

There has been forty rods welded by this method in the Southern Pacific shops in the last eighteen months. A slight defect in the welded portion was found in one case only. Not a single rod has failed in service.



LOCOMOTIVE MOTION RODS.

setting with a battering-ram, then point the end of the rod down under the steam hammer, as shown on diagram A. figure 1; this produces a round corner at H. To overcome this we raise a fillet at this point by cutting into the metal slightly and driving the metal back with a fuller, as shown. We then lay two pieces of iron B B on each side of the V shaped end of the rod, firmly welding them to the steel. Now we have the end of the rod shod with iron. By this method, the homogeneity of the different rods are discovered, regarding carbon. The variation is so pronounced in this regard that the same heat for welding on the two pieces B B will not answer for different rods. This being accomplished, we have iron to iron welds and can get high heats without bringing the steel to an igneous heat. We now bring our two pieces C C to a weld-

Now we have the most important member of a locomotive  $\frac{3}{4}$  in low carbon steel and  $\frac{1}{4}$  in iron.

Now the question arises, which portion of the rod is best adapted to resist the combination strains, this important member is subjected to, such as vibrating strains and compression, jars and sudden shocks, oftentimes the different strains acting at the same time. The writer claims that the iron portion is best adapted to resist the strains referred to as the iron has a fibrous structure and is not so apt to rupture from vibrating strains as low carbon steel with its crystalline structure, however, from laboratory tests, I have had made from sections of hammered steel rods, I find a vast improvement regarding ductility from test made.

Extract from report by Mr. S. Uren, read before the N. R. M. B. A. convention at Cleveland, Ohio.

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**Prices Current—Blacksmith Supplies.**

The following quotations are from dealers' stock, Buffalo, N. Y., Feb. 10, 1906, and are subject to change. Note the variations that have taken place since last month's quotations. All prices, except on the bolts, are per hundred pounds. On bars and flats prices are in bundle lots.

**Bars—Common Iron and Soft Steel.**

$\frac{1}{4}$ in. round or square; Iron, \$2.80; Steel, \$2.80	
$\frac{3}{8}$ in. " " " 2.40 " 2.40	
$\frac{1}{2}$ in. " " " 2.20 " 2.20	

**Flats—Bar and Band.**

$\frac{1}{4}$ x 1 in. Iron, \$2.40; Steel, \$2.40	
$\frac{1}{2}$ x $\frac{1}{2}$ in. " 2.30; " 2.30	
$\frac{1}{2}$ x 1 $\frac{1}{2}$ in. " 2.50; " 2.50	

**Norway and Swedish Iron.**

$\frac{1}{4}$ in. round or square, \$4.90	
$\frac{3}{8}$ in. " " 4.50	
$\frac{1}{2}$ in. " " 4.30	
$\frac{1}{2}$ x 1 in. " 4.30	
$\frac{1}{2}$ x $\frac{1}{2}$ in. " 4.20	

**Horseshoe Iron.**

For No. 1 shoe, $\frac{3}{8}$ x $\frac{1}{2}$ in. \$2.50	
For No. 2 shoe, $\frac{3}{8}$ x $\frac{1}{2}$ in. 2.50	
For No. 3 shoe, $\frac{3}{8}$ x $\frac{1}{2}$ in. 2.50	
For No. 4 shoe, $\frac{3}{8}$ x $\frac{1}{2}$ in. 2.50	

**Toe Calk Steel.**

$\frac{1}{2}$ x $\frac{3}{8}$ in. and larger, \$3.00	
--	--

**Spring Steel.**

$\frac{5}{8}$ to 1 $\frac{1}{2}$ in. Rounds. Op. Hearth \$3.00, Crucible \$5.00	
$\frac{1}{4}$ to 6 in. by No. 4 gauge to $\frac{1}{2}$ in. Flats. " 3.00, " 5.00	

**Carriage Bolts. (Net Price per Hundred).**

$\frac{1}{4}$ x 2 in. \$0.54	$\frac{3}{8}$ x $\frac{1}{2}$ in. \$0.82
$\frac{1}{2}$ x $\frac{1}{2}$ in. .58	$\frac{3}{8}$ x $\frac{3}{4}$ in. .96
$\frac{1}{2}$ x 3 in. .62	$\frac{3}{8}$ x 6 in. 1.81
$\frac{1}{2}$ x 8 in. .65	$\frac{1}{2}$ x 4 in. 1.70
$\frac{1}{2}$ x 16 in. .75	$\frac{1}{2}$ x 6 in. 2.10

**PATENTS**

that pay. FREE report on patentability. Write for special offer for obtaining patents, trade-marks, etc. Best references. WM. N. MOORE, Washington, D. C.

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BOX 236, Monroe, N. Y.

**FOR RENT**—Blacksmith shop, paint shop, house and two lots. Cheap rent. Write to  
F. POLZIN, Parker, Colo.

**FIRST-CLASS HORSESHOER** wants position in some good town west of Minneapolis, Minn. Address, M. H. MANDY, Brinsmade, N. D.

**WANTED**—To sell whole or half interest in good blacksmith business to a good horseshoer. Inquire, GEO. H. BROWN, Manlius, Illinois.

**FOR SALE**—Some extra blacksmithing and wagon tools for less than cost. As good as new. What have you to exchange?  
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**FOR SALE**—Good blacksmith shop, tools, house and outbuildings. Good location, Western Iowa. Address, GOOD SMITH,  
Care American Blacksmith, Buffalo, N. Y.

**FOR SALE**—At a bargain, complete set of tools and Blacksmith and Wagon Shop. Lot 66x120. Steady work for 8 men. Cause, old age.  
CHRIS. WAGNER, Applington, Iowa.

**FOR SALE**—A 6 H. P. Charter Gas Engine in excellent condition. Smooth running, efficient and easy to operate. Price \$225. Write to  
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**FOR SALE**—Blacksmith shop, house and lot, woodworking tools and stock. Only shop in town. Reason for selling, failing health. For further particulars, inquire of  
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**\$100.—INVEST \$10 AND MAKE \$100.** Make a few "Best Automatic Farm Gates" \$10 profit on each one. They sell themselves. All farmers like them. Township right, 10 sets castings and directions \$10.00.  
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**WANTED**—A first-class horseshoer and general blacksmith. A sober, industrious, married man, from 25 to 40 years old. No drinker need apply. A steady job and good wages to the right man. To begin work April 1st, 1906. Address  
O. L. McDOWELL, Oregon, Illinois.

**FOR SALE**—A first-class carriage painting and repair shop with tools and machinery. A good paying business. Established fifty-eight years. Selling out on account of age. A good proposition for the right party. For particulars address,  
D. BRIGGS, Attleboro, Mass.

**WANTED**—A partner with about \$1,000 capital to invest in horseshoe patent No. 722,610, March 10, 1903. Must give good references as to honesty and have some knowledge of the melting of iron and steel. For full particulars write to  
THOS. A. MCKAY, Ossineke, Michigan.

**WANTED**—Man to engage in the manufacture of hollow concrete building blocks of every kind, good demand for them every place. Very profitable, small investment, splendid opportunity for making money. For particulars and prices write  
HOOSIER CONCRETE BLOCK MACHINE CO.,  
Indianapolis, Ind. Station A.

**FOR SALE—SHAFTS.**—92 pair double bend survey shafts, buggy tip painted black and trimmed complete, price \$1.50 per pair. 43 pair double bend survey shafts, coupe tip, painted black and trimmed complete, price \$1.75 per pair. These prices only to this special lot. Send cash with order.  
PIONEER POLE & SHAFT CO., Piqua, Ohio.

**PATENTS**

Herbert Jenner, patent attorney and mechanical expert, 608 F. St., Washington, D. C., established 1883. I make an examination free of charge and report if a patent can be had; also the exact cost. Send for circular.

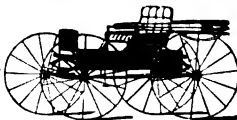
**HIGH-GRADE BUGGIES**

\$47.50

AND UP.

Dealers

Only.



Strictly  
First-  
Class  
Material.

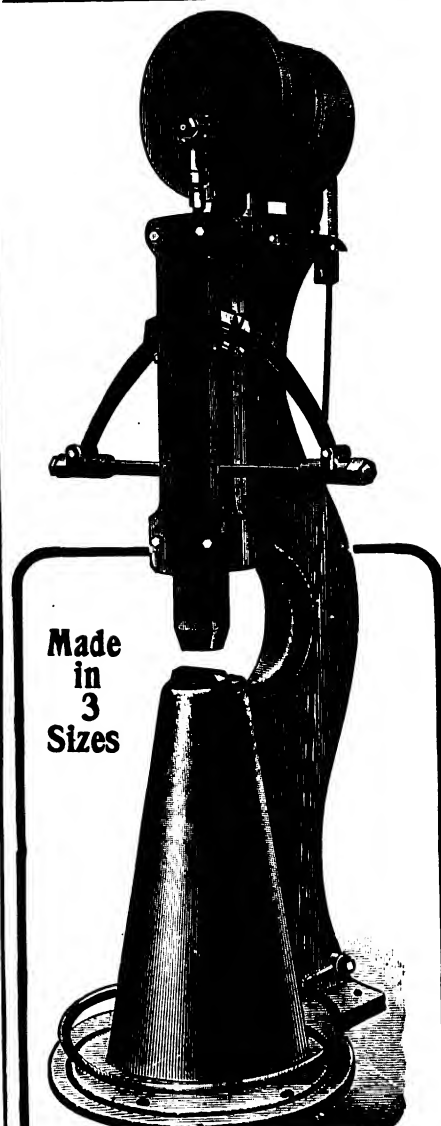
JAMES & MEYER BUGGY CO.

Write for Catalog and Prices. Lawrenceburg, Ind.

**GOOD SECOND-HAND GASOLINE ENGINES.**

1, $\frac{1}{2}$ H. P. Jack-of-All-Trades Fairbanks-Morse, complete. ....	\$50.00
1, $\frac{1}{2}$ H. P. Witte gasoline engine .....	40.00
1, $\frac{1}{2}$ H. P. Webster gasoline pumping engine, with electric spark and torch, .....	60.00
1, $\frac{1}{2}$ H. P. Webster gasoline pumping engine, complete, with torch igniter only ....	50.00
1, 2 H. P. Webster engine, complete, on combined base, electric spark and torch ..	60.00
1, 2 H. P. Stover gasoline engine, complete, with electric spark and torch ..	50.00
1, $\frac{1}{2}$ H. P. Fairbanks-Morse gasoline engine complete, with electric spark and torch ...	75.00
1, $\frac{1}{2}$ H. P. Webster engine, torch igniter only ..	65.00
1, 3 H. P. Burrell vertical gasoline engine, with torch igniter and electric spark ..	75.00
1, 3 H. P. Webster gasoline engine, complete, set up on combined base, with water tank and oil in base, electric spark and torch ..	80.00
1, 3 H. P. Webster engine, fitted for gas only, with electric spark and torch, in use 30 days, ..	100.00
1, 4 H. P. Chicago gasoline engine, used 30 days, just as good as new, electric spark, all set up on combined base. ....	90.00
1, 4 H. P. Webster vertical gasoline engine, torch igniter only. ....	95.00
1, 5 H. P. Webster horizontal gasoline engine, run 30 days, with electric spark and torch: cannot tell it from new. ....	190.00

ALLEN P. ELY & CO., - OMAHA, NEB.



Made  
in  
3  
Sizes

**The Perfect Power Hammer**

has no equal for simplicity and efficiency. Does a wide range of work from the lightest forging to heavy axle welding. Note the long guides, insuring a direct vertical stroke. No side motion. Easy to operate from the lightest tap to the heaviest blow. The Disk Attachment free. No other Hammer has this advantage. It only requires one Horse Power to run it. Write for prices.

Macgowan & Finigan Foundry & Machine Co.  
ST. LOUIS, MO.



A Good Set of Bit Brace Nut Wrenches is almost a necessity. A postal sent to us will bring net delivered price.



Do you want a Screw Plate cutting  $\frac{1}{4}$  to  $\frac{3}{4}$ ? Now is a good time to buy. Send for price delivered to nearest R. Station. CATALOG FREE

## DON'T BUY A SCREW PLATE

—Until you know what the "REECE" IMPROVED SCREW PLATES cost and have heard our arguments in their favor. It Pays to look around before you buy and find out all you can about the different makes. You will find that the "REECE" SCREW PLATES have more points of **REAL MERIT** than any other kind. You will find that you always get about what you pay for. Low prices mean cheap goods. Our prices are not excessive and when you get a "REECE" SCREW PLATE you get one that will cost only a trifle more than a cheap screw plate and outwear two of them. Quality counts every time.

SOLE MANUFACTURERS

**THE E. F. REECE CO.,**  
GREENFIELD, MASS., U. S. A.

## A Threading Outfit

That is suitable for general shop use—**THE "DUPLEX" BOLT DIE STOCK SET "A,"** range  $\frac{1}{4}$  to  $\frac{3}{4}$  inches.

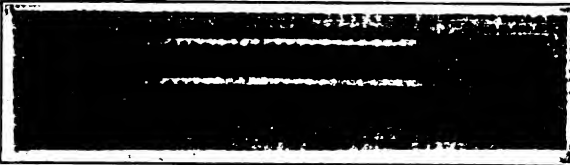


It contains dies that adjust without a wrench, and require no reversing when cut is finished. A variety of sets with desirable ranges. Ask for Catalog.

**The Hart Mfg. Company,**  
50 Wood Street,  
CLEVELAND, OHIO.

## ROLLER REACH IRONS

Prevent the Sway-Bar from Wearing into the Reach, and Allow the Wagon to turn Easily Without Friction.



\$2.00 for a box of 10.

Let us have your order.

**W. T. DAUM & BRO., 146 W. Lake St., Chicago, Ill.**

## QUICK-ACTING CLAMPS



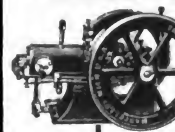
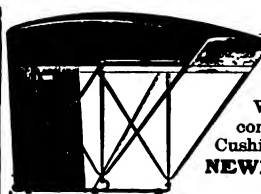
Are **Quicker - Stronger - Cheaper** than the old style clamps. No time wasted hunting the right size, or running screws in or out. We catalogue all styles; lengths up to twelve feet.



**JAMES L. TAYLOR MFG. CO., BLOOMFIELD, N. J.**

## Repairmen!

We make a specialty of recovering Dashes and Fenders. We also manufacture a complete line of Tops and Cushions. Write for prices.  
**NEWELL H. SNOW,**  
Binghamton, N. Y.



## THE CHAPMAN STARTS EASY

Drives trip hammer, iron lathe and drill presses all at same time.  
Safe, Strong, Durable, Economical  
SENT ON TRIAL—EASY TERMS  
Write for Circular A. B.  
**H. L. CHAPMAN, Marcellus, Mich.**

We make the following sizes:  
No. 1, 3 in. wide, 14 in. high  
" 2, 3 1/2 " " 14 " "  
" 3, 3 3/4 " " 10 " "  
Price, \$1.65 per set of 4 stks  
Cash with order. Weight, 16 lbs. per set.



This shows the strength of our **STANDARD** compared to the old style.

## The Bruce Malleable Wagon Standard

This Malleable Iron Bolster Standard has been tested thoroughly, and we guarantee it strictly as represented.

Anyone familiar with the farm wagon will readily see the great advantages of the Malleable Iron Bolster Standard over the old style.

1. Made of the best grade malleable iron. It has been thoroughly tested by factories and wagon makers and pronounced a great success.  
2. It is attached to bolster by means of two bolts passing through bolster from the side, and one bolt from top to bottom of bolster, thus holding standard perfectly solid, and at the same time strengthening end of bolster, which in old style is weakened by mortise.

3. The Malleable Iron Standard has a 3 1/2 in. face at base, which prevents wear on wagon box, while the old style has only a 7-8 inch face.

4. Great time saver. Can be attached to bolster in one-fourth the time required to put on wood stake. Adapted to new and repair work. The price will justify all classes of the trade in using this standard.

**A. H. HARSHBARGER, Bement, Ill.**

## FOR HORSESHOERS

A TEXT BOOK OF

## HORSESHOEING

BY A. LUNGWITZ.

Translated from the 10th German Edition  
by JOHN W. ADAMS, A.B., V.M.D.

178 Pages-160 Illustrations

CLOTH, \$2.00 NET

THE BEST BOOK PUBLISHED  
ON THE SUBJECT

Send for Descriptive Circular

**J. B. LIPPINCOTT COMPANY**

PUBLISHERS PHILADELPHIA

**SPECIAL OFFER.**

**Send \$1.00** for instructions how to make DeCelle's celebrated welding preparation. Unsurpassed, the blacksmith's greatest aid. You can mix it in 15 minutes and it will be in shape for a year's use. It's a money maker.

**Send \$1.00** for a valuable invention to the horseshoer, a new way to put a clipping horn on a common anvil. Easy and worth many times the small price asked. Just what you need.

**Send \$1.00** and receive our method to rig up an attachment to hold a horseshoe steady while drawing a calk sharp. Your brother smiths say it's great.

These 3 valuable methods and DeCelle's Hoof-Trimming Nippers sent for \$5.00. Write for particulars. Circulars free.

We send plain instructions and descriptive circulars with each order for Nippers. They work to perfection.

**J. D. DeCELLE, - - Ft. Collins, Colo.**



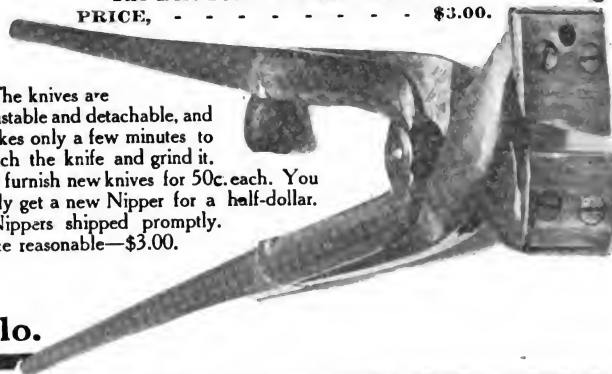
The jaws and handles of the Nippers are made of steel castings with double leverage in the handles. The knife is made of special edge-tool steel and having a shear cut, works with one-half the leverage required for the old square-cut tool. Rubber with screw to regulate it.

## THE HORSESHOER'S FRIEND DeCelle's Hoof-Trimming Nippers

The Best Tool of its kind on Earth.

PRICE, - - - - - \$3.00.

The knives are adjustable and detachable, and it takes only a few minutes to detach the knife and grind it. We furnish new knives for 50c. each. You really get a new Nipper for a half-dollar. Nippers shipped promptly. Price reasonable—\$3.00.



## The Everlasting Tubular Steel Doubletrees, Singletrees and Neck Yoke.

No wagon or truck complete without them.

Pattern No. 56 A.



## The Pittsburg Tubular Steel Whiffletree Co.

Pittsburg, Pa.

Equipped with  
Forged Fittings.

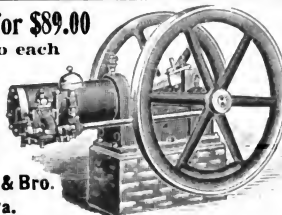
## 4 H. P. Engine for \$89.00

Only one sold to each customer.

### Capital Engines

Fully Guaranteed. Warranted to run a 28 in. saw and cut 20 cords of wood per day or money refunded.

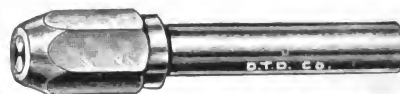
C. H. A. Dissinger & Bro.  
Wrightsville, Pa.



## WHY NOT BUY A CHUCK

That will fit the spindle of your drill press, holding drills  $\frac{1}{4}$  to  $\frac{1}{2}$  in. inclusive, with reducer to  $\frac{3}{8}$ " Drills held by this chuck are much cheaper than drills with  $\frac{1}{4}$  in. or  $\frac{1}{2}$  in. shank. Simplest and cheapest chuck on the market.

WRITE FOR CATALOGUE AND PRICES



**DETROIT TWIST DRILL CO.**  
228 21st Street, Detroit, Mich.

## Why Not Stop Your Troubles?

"A Wizard  
Tubular"  
Does It.



Armature incased in WATER-PROOF non-corroding brass tube. All brass screws. Friction, Belt or Governor drive. Brush-holders removed without loosening screws.

All parts polished brass. Contact and Jump Spark.

A TRIAL WILL CONVINCE YOU.

Most popular and satisfactory Magneto on the market. Price as popular as Machine.

GOVERNOR DOES AWAY WITH BATTERIES AND SWITCHES.

**HERCULES ELECTRIC & MFG. CO.**  
INDIANAPOLIS, INDIANA.

Write for catalogue and SPECIAL OFFER.

## Trade Literature and Notes.

AMONG NEW CATALOGUES recently received is an interesting one from H. L. Chapman of Marcellus, Michigan, neatly printed and handsomely illustrated. The booklet gives a list of the essential qualities of a good engine and explains how Chapman Engines fill every shop requirement. This catalogue is well worth writing for and will be sent free on request.

"LITTLE DAVID" is the latest to be added to our line of screw plate advertisements. Conant & Donelson Co., Greenfield, Mass. have put upon the market an excellent line of screw plates, stocks and dies and an illustrated folder describing them has come to our attention. Readers are invited to write to the above address for information. See advertisement on page 24.

THE WALLACE SUPPLY CO., 56 Fifth Ave., Chicago, Ill. send us an interesting catalogue of bending machines of all descriptions. In the book is a long list of testimonial letters received from their customers, all speaking very highly of the Wallace devices. The catalogue is fully illustrated and shows just how the different machines work. Get a copy—it is free for the asking.

TWO OF OUR ADVERTISERS have joined forces for a bigger and more profitable business. Mr. C. A. Halliday and Schubert Bros. Gear Co. both of Oneida, N. Y. have consolidated to carry on an extensive business in carriages, gears, tops and trimmings. This company wishes to announce that they are carrying a most complete line of goods of this kind, and are in position to furnish every requirement of our readers.

A HANDY SHOP DEVICE is The Reynolds Axle Gauge, manufactured by The E. T. Buhl Mfg. Co. of Cleveland, Ohio. For simplicity of adjustment and accuracy of gauge they claim it has no equal and are willing to send it to any address on 30 days trial free. Descriptive circulars may be had by addressing this firm at the above address.

A RECENT LETTER from the Cortland Specialty Co. of Cortland, N. Y., announces that this company has discontinued the manufacture of welding compound with the view of giving more attention to the chemical end of their business. Our readers will be glad to know, however, that the firm will continue to make the famous Banner Brazing Compound which so many smiths are now using to good advantage.

ON PAGE 29, The Lima Gas Engine Co. of Lima, Ohio make the very liberal offer to our readers to send a 4 H. P. engine for \$89.00. This firm states that they will make easy terms of payment to American Blacksmith subscribers and if you are thinking about installing power it may pay you to write and get their proposition. This firm claims that "The Lima" is the best power for the shop owner and fully guarantees every engine.

"A FEW WORDS OF INTEREST TO MECHANICS" is the title of a novel booklet issued by the E. F. Reece Co., of Greenfield, Mass. The cover resembles a box of screw plates, being cut in that shape and printed in colors imitating the grain of the wood. On the inside pages there are many valuable hints on the Reece improved screw plates, taps and dies. There is also an interesting price list of the different assortments. Write for a copy.

WOLFE'S COLD TIRE SETTER is now being manufactured by The G. M. Yost Company of Waynesboro, Pa. It is claimed that this machine combines the four most desirable points of a cold tire setter, namely strength, endurance, quick adjustments and economy of space and in appearance this tire setter is indeed very neat. The G. M. Yost Co. offer to send descriptive circulars free to anyone interested in this line. See their advertisement in this issue.

ON OUR FRONT COVER will be found the advertisement of The House Cold Tire Setter Co. of St. Louis, Mo. This firm offers to the trade a new improved machine with a novel combination shear and punch, for which no extra charge is made. The new tire setter has both hand and power attachment, is simple, strong and efficient. We are told that this machine is giving perfect satisfaction wherever used. Readers who expect to get a new tire setter this season should carefully investigate the merits of a machine before buying and for this purpose the above named firm have published an illustrated descriptive catalogue which they will send to your address free upon request.

THE 20TH CENTURY TOOL BOX recently put

on the market by Patterson, Gottfried & Hunter of New York City is a very novel and useful device. The case is round, made of cold rolled steel, the ends being of cast steel and the drawers of wood. The case is compact, neat in appearance, lighter than a wooden tool box and most durable. Interesting prices and descriptive circulars free on application. Write to Patterson, Gottfried & Hunter, Ltd., 146-150 Center St., (Cor. Walker) New York City.

THE ACCOMPANYING ENGRAVING shows the

Induction Coil Company's Ball-bearing Vibrator. Particular attention is directed to the adjustment screw. The contact on the lower side of the screw head is made by a ball bearing against the teeth thereof making a firm and substantial connection at all times. No set screws to loosen and set up when making adjustments; it can be done with the thumb and finger. The vibrator is equipped with a double spring, one portion of which is so set that when in motion it engages the end of the other spring in such manner as to produce a so-called hammer blow, thus making impossible any sticking at the points of contact.

IT IS NOT AT ALL UNUSUAL nowadays to find a modern clipping machine as part of the equipment of the alert, wide awake horseshoer. The enormous and increasing demand for clipping machines has brought their manufacture to such perfection that a complete modern clipping outfit can be bought for less than the machine will earn in a day. With no experience at all, it is said a horse can be clipped in half an hour and the machines are so simple and easy to run that the average lad can operate one all day and not be tired.

It is reasonable to believe that more and more owners will come to have their horses clipped each season. It saves the animals from taking cold, makes them twice as easy to clean and vastly improves their health and general appearance.

The Chicago Flexible Shaft Co., 101 La Salle Ave., Chicago, are said to manufacture more clippers than any other concern in the world. They have one style of machine that seems to meet with particular favor among blacksmiths. It is inexpensive and anyone can operate it. If you do not already have a clipper, it will be a profitable investment to get their catalogue which describes every kind of modern clipping machine.



*Little Giant.***A SIGN OF  
Strength and Quality****The "Little Giant" Drill Press**

Is a strong, service-  
able,

compact  
and thoroughly  
well made machine  
and like all other

"Little  
Giant"  
machines,  
is Fully  
Guaran-  
teed to  
give per-  
fect sat-  
isfaction

**GENERAL DIMENSIONS**

Drills to one inch di-  
ameter hole. Drills  
to center of 11-inch  
circle. Swinging Ta-  
ble (either side). Easily  
adjusted to height.  
Spindle is made of steel  
and has TOOL STEEL  
SET SCREW hardened  
and tempered.  
Spindles are made to re-  
ceive  $\frac{1}{2}$  inch or  $\frac{1}{4}$   
Shanked Twist  
Drills.

Leading Dealers  
Everywhere  
carry "Little Giant"  
Machines.

Write for our complete  
Catalogue—Free.

A Complete line of  
Drills, Vises, Bolt-  
headers, Swage  
Blocks and Mandrels  
Fully Illustrated and  
Described.

Send name and address  
today for Catalogue.

**B. B. NOYES & CO.**

Greenfield, Mass., U. S. A.

**THE "MODERN FOOT-POWER HAMMER"****Takes the Place of a Helper**

by the anvil, for sharpening plowshares, culti-  
vator shovels, etc., and for nearly all kinds of gen-  
eral forging and welding, also for striking on tools,  
such as Chisels, Punches, Flatteners, Swages, etc.  
Will strike just as light or heavy as desired  
by the operator, and is very easily operated.  
Cannot be fully appreciated until tried  
Write for Circular and Price.



Sam. Schultz, General Blacksmithing  
and Shoeing,  
Mills, Neb., Jan. 16, 1906.

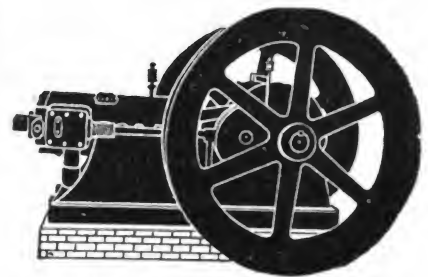


MR. A. S. LOCKREM, Pierpont, So. Dak.  
DEAR SIR:—The Foot Power Hammer I  
purchased of you Feb. 18, 1900, has been in use  
ever since, and I would not do without it for 3  
times the price of it.



I purchased a Power Hammer, also,  
three years ago, and if I was to give  
up either one it would be the power  
hammer. I use the Foot Power Ham-  
mer 10 times as much as the Power  
Hammer as it is always ready. It can't  
be beat. The second Hammer which I  
purchased of you Apr. 8, '06, and put in  
my other shop at Grayson, S. D., is also  
giving good satisfaction.  
Yours truly, SAM SCHULTZ.

AUG. S. LOCKREM, Pierpont, S. D.

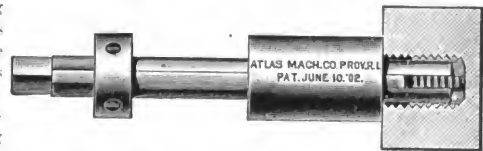
**OUR 30 DAYS FREE TRIAL OFFER**

LAZIER horizontal or vertical gas and gasoline  
engines, portable, on skids and stationary types,  
shipped on trial direct from our factory. Easy  
payments to blacksmith customers. Will accept  
part cash and monthly payments. If you buy  
immediately, we will allow you all dealers' com-  
missions, as you deal direct with us. A written  
guarantee covers every engine shipped.  
Write for particulars and catalog.

**LAZIER ENGINE CO.**585-591 Ellicott Square,  
BUFFALO, N. Y.**ATLAS EXTRACTOR OF BROKEN TAPS**

A strong and simple device for removing  
taps broken off in a tapped hole. Works  
quickly and easily and will not injure the  
work. A time and money saver; always  
ready for instant use.

These tools are made in sizes of one-  
sixteenth from  $\frac{1}{8}$  in. up to and including  
 $\frac{3}{4}$  in., and in one-eighths from  $\frac{5}{8}$  in. to  
 $1\frac{1}{4}$  in. inclusive, for three and four groove taps.



Write for circulars and price list.

Also makers of the ATLAS SWIVEL VISE and  
ATLAS TOOL MAKER'S VISE.

**ATLAS MACHINE COMPANY, PROVIDENCE, R. I.****VULCAN IRON WORKS**

MASON CITY, IOWA.

—INCORPORATED—

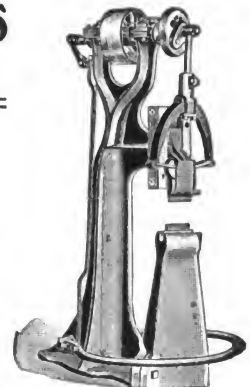
Prices and goods right.  
Catalog free, write today.

**Universal Tenon  
AND  
Boring Machine**

for wagon repair shops.  
Cuts tenons on set of  
wheels in 12 minutes.

**Vulcan Power  
Hammer,**

Only perfect adjustable  
stroke, operated en-  
tirely by treadle.

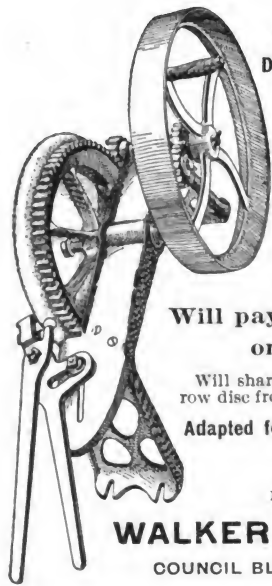


**SOLD BY LEADING  
DEALERS EVERYWHERE.**

**IT RINGS  
LIKE A BELL.**

COLUMBIUS FORGE & IRON CO.  
OHIO - U. S. A.





**No. 1 NOVELTY  
DISC and COULTER  
SHARPENER.**

*Every  
blacksmith  
should  
have  
one.*

**Will pay for itself in  
one day.**

Will sharpen a plow or harrow disc from 12 to 18 inches.

**Adapted for Hand or Power**

MADE BY

**WALKER MFG. CO.**

COUNCIL BLUFFS, IOWA.

## PATENTS PROTECT YOUR IDEAS

No Patent, No Fee. Consultation Free.  
Established 1864.

**MILO B. STEVENS & CO.,**  
852 14th St., Washington.

## PATENTS,

**TRADEMARKS and COPYRIGHTS.**  
Send your business direct to Washington. Saves time and insures better service. **PERSONAL ATTENTION GUARANTEED.** Twenty-five years active practice. **SPECIALTY: "Working on the Failures of Others".**

**SIGGERS & SIGGERS (Patent Lawyers)** Suite 15, N. U. Bldg., WASHINGTON, D. C.

## PATENTS

Send sketch or model for free examination and report as to patentability. Patents promptly secured. Advice free; terms low; highest references, and best service. Address,

**WATSON E. COLEMAN,**  
Registered Patent Attorney, WASHINGTON, D. C.

## BOLT CLIPPERS



EACH ONE GUARANTEED.

**CHAMBERS BROS. CO.,**

N. Fifty-Second Street,  
Philadelphia, Pa.

It's the  
**SPARK**  
that  
Counts



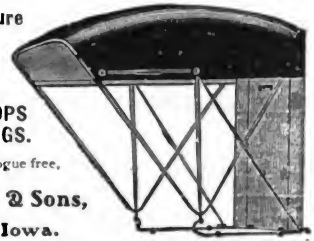
**Ignite your engine with our  
IMPROVED I. C. C.  
JUMP SPARK COILS**  
We guarantee them against all imperfections in workmanship and material. Write us if your engine doesn't work properly.  
**INDUCTION COIL CO.,**  
COILS FOR BLACKSMITHS. MILWAUKEE, WIS.

We Manufacture

a Complete  
Line of  
**CARRIAGE TOPS  
and TRIMMINGS.**

Illustrated catalogue free.  
Write to-day.

**D. A. Laros & Sons,**  
Grinnell, Iowa.



## THE VICTOR

**SICKLE-DISC TOOL  
GRINDER &  
DRILL**

2,000 to 2,500  
revolutions  
per minute.  
Strongly  
built, has  
steel bearings,  
smooth running  
durable and  
efficient.



This cut shows the machine in use as a Sickle Grinder. It can be set at any angle for long or short bevel. It will grind just where it is needed, and the work is directly under the eye of the operator. It will grind any sickle better and quicker than any other machine on the market.

Write for Prices and Interesting Circulars.  
Sent Free.

**THE MILLER MFG. CO.,**  
SULLIVAN, OHIO.

# GAS OR GASOLINE POWER

When produced by an I. H. C. Engine is unquestionably the best and most economical power obtainable

Every manufacturer, shop or mill owner, or power user of any kind, is interested in the cost of power, for ordinarily it represents the burden of expense in his business. The cost of power from an I. H. C. Gas or Gasoline Engine, however, is reduced to the minimum, only about one-tenth of a gallon of gasoline per horse power per hour being consumed.

With an I. H. C. Engine there is no delay in firing up—no waiting for Steam.

**IT IS ALWAYS READY FOR WORK**

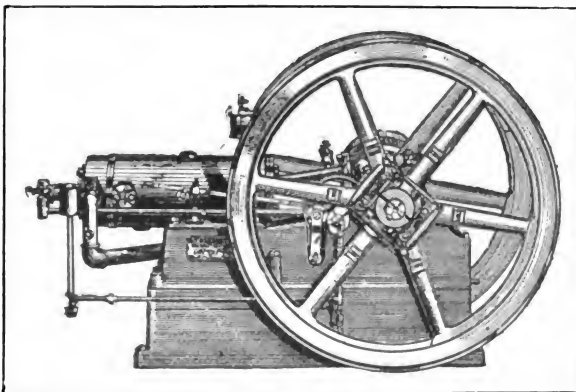
**AND IT ALWAYS WORKS**

Simplicity in design is a strong feature in the construction of the I. H. C. Engine. Thus it is possible for any person with ordinary intelligence to operate this engine. It is so simple that it does not require an engineer—additional evidence of its great economy as a power producer over the steam engine.

**SAVE MONEY, SAVE TIME, SAVE LABOR**

by using I. H. C. Gas or Gasoline Engines, for any purpose requiring power within their rated capacity. I. H. C. Engines are made in the following styles and sizes: Horizontal, Stationary and Portable—4, 6, 8, 10, 12 and 15 h. p. Vertical—2, 3 and 5 h. p.

Our catalog explaining the advantages derived from the use of I. H. C. Engines will be mailed upon request.



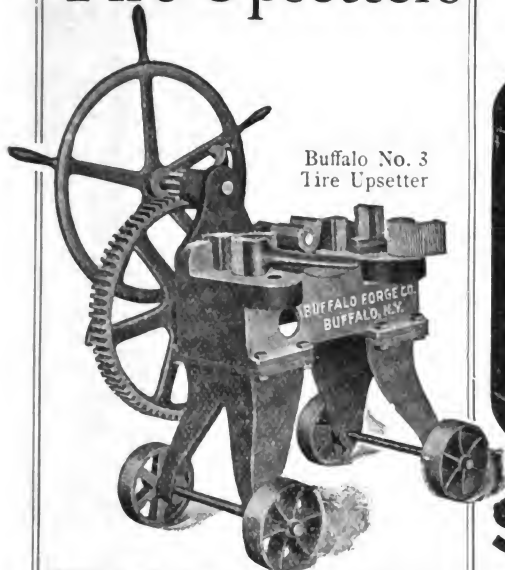
**International Harvester Company of America**

(Incorporated)

No. 7 U Monroe Street, Chicago, Ill.

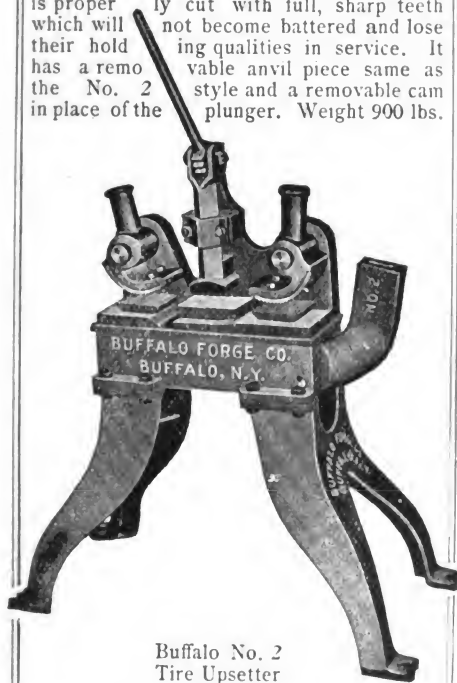


## Buffalo Tire Upsetters



Buffalo No. 3  
Tire Upsetter

THIS is a high power machine designed for the heaviest tires. It is of the edge grip type operated by a windlass through reduction gears. Grips have a throw of  $1\frac{3}{4}$  in., which, with the ten to one reduction gears, enable a force of a ton to be brought on the work with less than ten pounds pull on the wheel. Grips are faced with tool steel which is properly cut with full, sharp teeth which will not become battered and lose their holding qualities in service. It has a removable anvil piece same as the No. 2 style and a removable cam in place of the plunger. Weight 900 lbs.



Buffalo No. 2  
Tire Upsetter

THIS machine upsets  $3 \times \frac{5}{8}$  tires and axles up to  $1\frac{1}{2}$  in. square. Grips are faced with tool steel with teeth carefully cut and tempered. Lower grips adjust themselves automatically to curvature of tire or for straight work. Upset both straight and curved work. The plunger prevents all buckling or kinking. Weight 275 lbs. Height 22 in. Write for circular.

**BUFFALO FORGE CO.,**  
BUFFALO, N. Y.  
The Canadian Buffalo Forge Co., Montreal



## HOW TO BUY SOLID BOX VISES

When you buy a Solid Box Vise, why not PAY for it according to the AMOUNT OF WORK it will DO for you?

1. The wider the jaw, the larger the work it will take.
2. The WIDER the vise OPENS, the larger the work it will hold SECURELY.
3. The HEAVIER the vise, the HEAVIER the work it will STAND UP UNDER.

"Columbian" Solid Box Blacksmith's Vises are STANDARD in these three respects.

Better still, they are finely finished, and high grade in every particular.

Our Vise and Anvil Catalogue No. 16 gives the size of jaw, the distance vise opens, the weight, etc., of each and every "Columbian" vise, from a 25 to a 200 pounder.

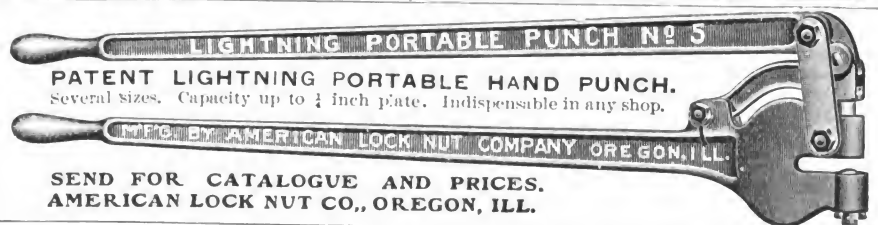
Whether you buy a "Columbian" vise or not, the vise you buy should come up to the dimensions shown in our Vise and Anvil Catalogue No. 16.

Send for it today, and keep it on file.

It will enable you to "get your money's worth" when you are ready to buy. A postal will secure it.

**THE COLUMBIAN HARDWARE CO.**

MANUFACTURERS  
CLEVELAND, OHIO, U. S. A.



**LIGHTNING PORTABLE PUNCH NO. 5**

**PATENT LIGHTNING PORTABLE HAND PUNCH.**  
Several sizes. Capacity up to  $\frac{1}{4}$  inch plate. Indispensable in any shop.

**MADE BY AMERICAN LOCK NUT COMPANY OREGON, ILL.**

SEND FOR CATALOGUE AND PRICES.  
AMERICAN LOCK NUT CO., OREGON, ILL.

**HAND  
FORGED**



**BUTCHER  
KNIVES**

**A GOOD  
SIDE-LINE**

Hundreds of blacksmiths are making large profits by selling these blades. Each one is fully warranted. Made of Sanderson Steel.

Round or riveted. All sizes from 5 to 8 inch. Handles ready to put on, at each.

**\$ .15 EACH  
\$ 1.50 DOZ.**

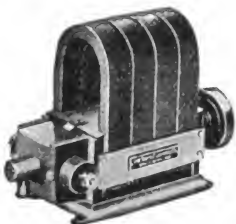
Hand Forged Razors, ready to use, 40 cents each.  
Pocket Knife Handles in variety, 10 cents each. Send for sample.

**WOODWORTH KNIFE WORKS, NUNDA, NEW YORK**

# VIM MAGNETO

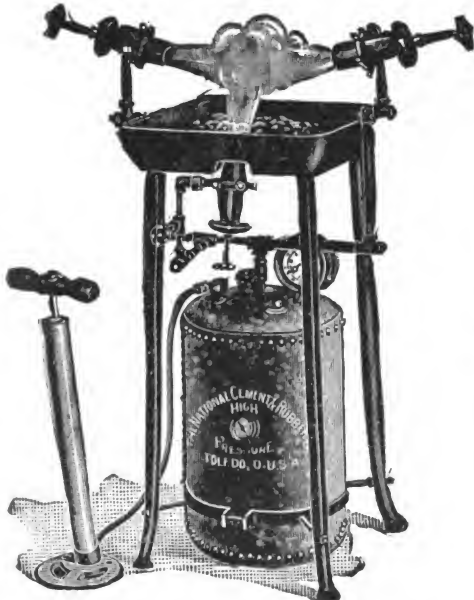
for Butt Spark Engines

STANDS FOR  
QUALITY  
SIMPLICITY  
DURABILITY  
EFFICIENCY  
RELIABILITY  
ECONOMY  
AND  
SATISFACTION



The Tritt  
Electric Company, UNION CITY,  
INDIANA.

"High Pressure" Brand No. 2 Brazing Forge



Patented February 7, 1900. The up-to-date machine for brazing agricultural implements, automobiles, bicycles, etc. Will do all kinds of brazing, both light and heavy. It is fitted with three powerful improved Hydro Carbon Burners. Both Gasoline and Kerosene Machines in stock. Write for description.

THE NATIONAL CEMENT AND RUBBER MFG. CO.  
3051 MONROE STREET, TOLEDO, OHIO, U. S. A.

## "The Australasian Coachbuilder & Wheelwright."

A Monthly Illustrated Technical Journal circulating amongst Coachbuilders, Wheelwrights and Blacksmiths throughout the Commonwealth of Australia, New Zealand and South Africa.

Advertising and subscription rates on application to

J. E. BISHOP & CO.,  
65 MARKET STREET,  
Sydney, Australia.

### New Era Electric BLOWER

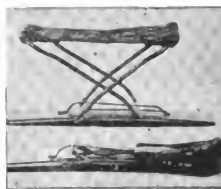
Direct connected, has been designed especially for the blacksmith, and it is his ever-ready helper that works for less than five cents a day, and never tires. It places him on an equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.



Write for circular and particulars.

NEW ERA ELECTRIC CO.

942  
W. Lake St.  
CHICAGO.



### THE ITHACA THIRD SEAT Price \$1.50

Will allow the Third Person, and the occupants of a Buggy or Cutter Seat, to ride with ease and comfort.

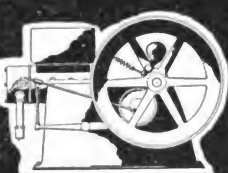
Try one and be convinced that we have the only Third Seat made that will sit steadily on a spring cushion. The only one wide enough for an adult to ride with comfort. (14 inches wide). To have the Seat well advertised, for the Spring Trade of 1906, for the next sixty days we will ship by express, to any dealer or blacksmith, one of our Seats, on receipt of 85 cts. (Eighty-Five Cents).

Manufactured by

THE ITHACA CARRIAGE CO.,  
ITHACA, N. Y.

5 H.P.

\$162<sup>50</sup>



Please send description of your 5 H. P., 1906 Special Gasoline Engine. Also liberal offer, to

FROM FACTORY TO USER

WE SAVE YOU AGENTS' & DEALERS' PROFITS.

THIS ENGINE IS NOT A TOY, BUT IS LARGE ENOUGH TO SHELL CORN, GRIND FEED, SAW WOOD AS WELL AS PUMP WATER.

FULLY GUARANTEED.

ABOVE PRICE INCLUDES ENGINE COMPLETE READY TO RUN

Cut out this entire ad., write your name and address plainly and mail to

SPADE ENGINE CO.,  
VICKSBURG, MICH.

## SKOW'S ROTARY DISC SHARPENER

The most practical and economical machine on the market. Will roll any size discs. Guaranteed to excel all others. "You may make my regards for the machine as high as you want and I will vouch for them."

W. S. WILSON, Fowler, Kas.  
I have tested your Disc Sharpeners thoroughly and find it is a money maker for me. I sharpen 16-inch discs in about five minutes and it does the best kind of work.

Yours truly,  
ROBERT FISCHER.

Sent on trial to responsible parties.  
Catalogue FREE for the asking.

SKOW BROS., Newton, Iowa



## TRETHEWEY'S BLACKSMITH HAMMER

All Modern Improvements.  
SUPERIOR TO ALL OTHER MAKES.

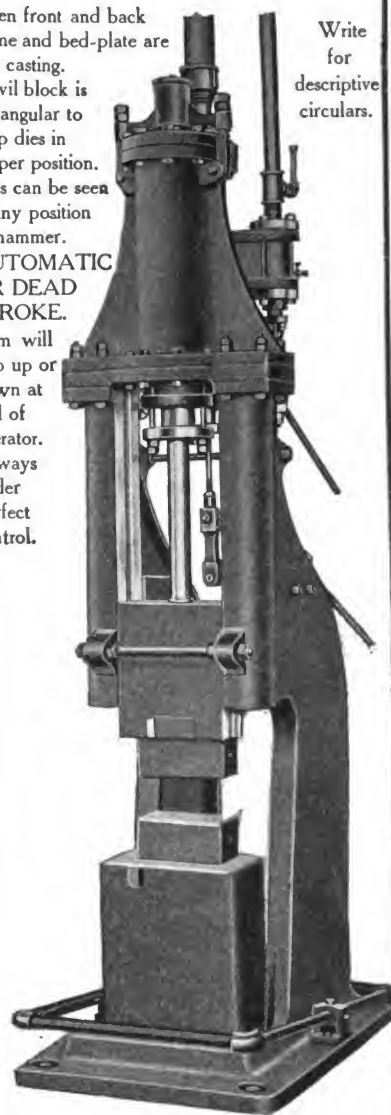
Open front and back frame and bed-plate are one casting.

Anvil block is rectangular to keep dies in proper position. Dies can be seen at any position at hammer.

AUTOMATIC OR DEAD STROKE.

Ram will stop up or down at will of operator. Always under perfect control.

Write for descriptive circulars.



We also make

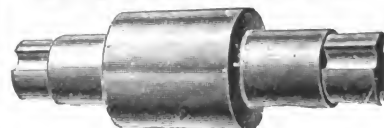
SOLID STEEL KNIVES  
HEAR

ROTARY, STRAIGHT OR ANGLE.

ROLL TURNING TOOLS

ANY SIZE OR SHAPE.

ROLL TURNING PLUGS.



Hardened Forged Steel Rolls  
for Cold Rolling and  
Steel Specialties of Any Kind.

Write for particulars.

SAMUEL TRETHEWEY & CO.,

Forty-Seventh St., PITTSBURGH, PA.

**NATIONAL BLACKSMITH'S**



**DRILL CHUCK**

Made entirely of steel, especially for blacksmithing and carriage work. Positive, strong and self-cleaning. Casts no shadows. Will save cost over other chucks in the saving of time. Money refunded if not as represented. Ask your jobber for it or send direct for prices and circulars. The best is the cheapest.

**THE ONEIDA NATIONAL CHUCK CO.,**  
Oneida, N. Y., U. S. A.

**S. N. BROWN & CO.**  
DAYTON, O.  
— MANUFACTURERS OF —  
**Vehicle and Automobile Bows**

**RUBBER STAMPS  
STEEL STAMPS  
AND STENCILS**  
SEND FOR CATALOGUE.



**A. C. GIBSON CO.,**  
338-340  
WASHINGTON STREET  
BUFFALO, N. Y.

**RUBBER RUNABOUT, \$35.00**  
**TIED TOP BUGGY, \$27.50**  
**BUGGY TOPS, \$4.50**



Write for 100-page Catalogue. It's free. Compare Our Prices.  
**BUOB & SCHEU,** Estab 1883 500-520 EAST COURT ST. CINCINNATI, OHIO.

**ONLY 60 CENTS** Did you ever try to shoe a horse that would not stand still? By the use of my great **Pulley Breaking Bridle** you can make the most restless horse stand as quiet as a lamb—even ugly horses, stallions, etc., completely subdued while being shod. Price, **Only 60c postpaid.** You should own one. Will bring business to you. Send for circular telling all about it.



**PROF. J. W. BEERY, PLEASANT HILL, OHIO.**

**"CHICAGO"**  
**EMERY WHEELS**  
**CUT QUICK**

A wheel that will do the work in one-fourth to one-half less time is by far the cheapest in the long run. A wheel that will save only one hour per day during your busy season would pay for itself in full.



**"CHICAGO"**  
**WHEELS SAVE TIME**

They're made of stuff that cuts

Emery Wheels, Glue, Emery, Polishing Wheels, Grinding Machinery

136 Page Catalogue for the Asking


*Chicago Wheel & Mfg. Co.*  
42 W. RANDOLPH ST.  
**CHICAGO, U. S. A.**

**WESTFAHL (MILWAUKEE) RASPS**  
Can't be excelled for durability. "Hand Punched."



Our new 18 inch rasp. Round ends.  
Ask your dealer for the Westfahl brand. If he can't supply you write us your requirements. Mention The American Blacksmith.  
**WESTFAHL & CO., Milwaukee, Wis.**

**PAT'D APRIL 29th, 1902.**



**THE REYNOLDS AXLE GAUGE**

Simple, accurate and durable. Your equipment not complete without one. Give this Gauge close examination. Best material and workmanship guaranteed. Beam is the very best tubing; one inch in diameter, six feet long. Pivot arm, gauge plate and indicator all of solid brass. Self adjustable to any length or size of axle.

**This Superior gauge is sold by dealers everywhere and always gives perfect satisfaction.**

**If your dealer cannot supply you write to us for our liberal thirty day free trial offer.**

The exact amount of set or gather of the axle is registered automatically in inch measure. You should have one of them in your shop. Write today for interesting descriptive circulars, sent free upon request. Drop us a postal for them.

**E. T. BUHL MFG. CO., CLEVELAND, OHIO, DEPARTMENT A.**

**KELLER ECCENTRIC BRAKE**

Warranted to lock wheels with three ton load with ease; can be applied to any wagon. Works without aid of ratchet. Made in two sizes.

Note its construction, sturdy and serviceable.



Blacksmiths, wagon and buggy repairers especially, will see at a glance the merits of this axle cutter and appreciate its usefulness.

It will cut a pipe, boiler tube or shaft, as little or as much as desired and do its work accurately, taking the merest shaving from the end or cut in two at any point, its bearings being all on one side of the knife.

Attractive propositions offered to live agents.

**Rod, Pipe and Axle Cutter**



Write for details

**Keller Mfg. Co., SAUK CENTRE, MINNESOTA.**

FOR CARRIAGES, AUTOMOBILES, SPRING WAGONS, TOP WAGONS, BUGGIES, SEATS, ETC.

**KANSAS CITY, MO.**

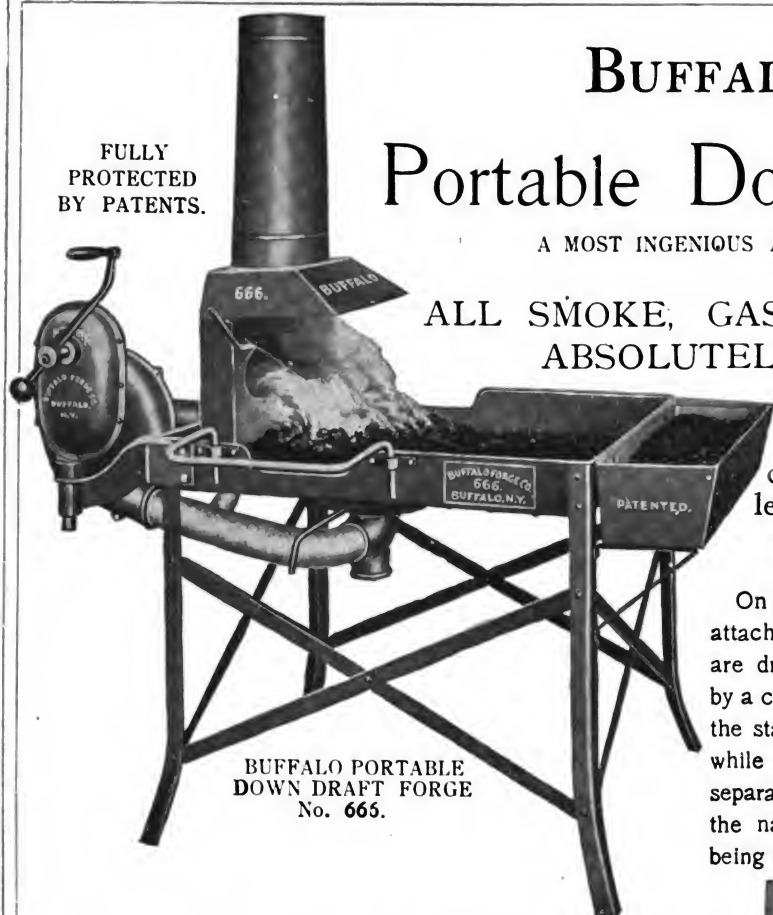
**MINOGUE SEAT CO.**

**VEHICLE BODIES IN THE WHITE**

WRITE FOR PRICES



FULLY  
PROTECTED  
BY PATENTS.



BUFFALO PORTABLE  
DOWN DRAFT FORGE  
No. 666.

## BUFFALO No. 666

# Portable Down Draft Forge

A MOST INGENUOUS APPLICATION OF THE BUFFALO DOWN  
DRAFT SYSTEM.

ALL SMOKE, GASES, FUMES AND CINDERS  
ABSOLUTELY DONE AWAY WITH.

The hottest flames and stifling heat  
can no longer cause the smith such dis-  
comfort as he has hitherto been com-  
pelled to submit to.

## HOW THEY WORK

On turning the crank of the powerful No. 200 Blower  
attached to this forge, all smoke and gases from the fire  
are drawn into the stack by means of the draft produced  
by a connection to fan case. The larger part escapes up  
the stack by reason of the natural and induced draft  
while a portion passes through the fan into tuyere. A  
separate connection from blast pipe into stack strengthens  
the natural draft and is of great service when fire is  
being started.

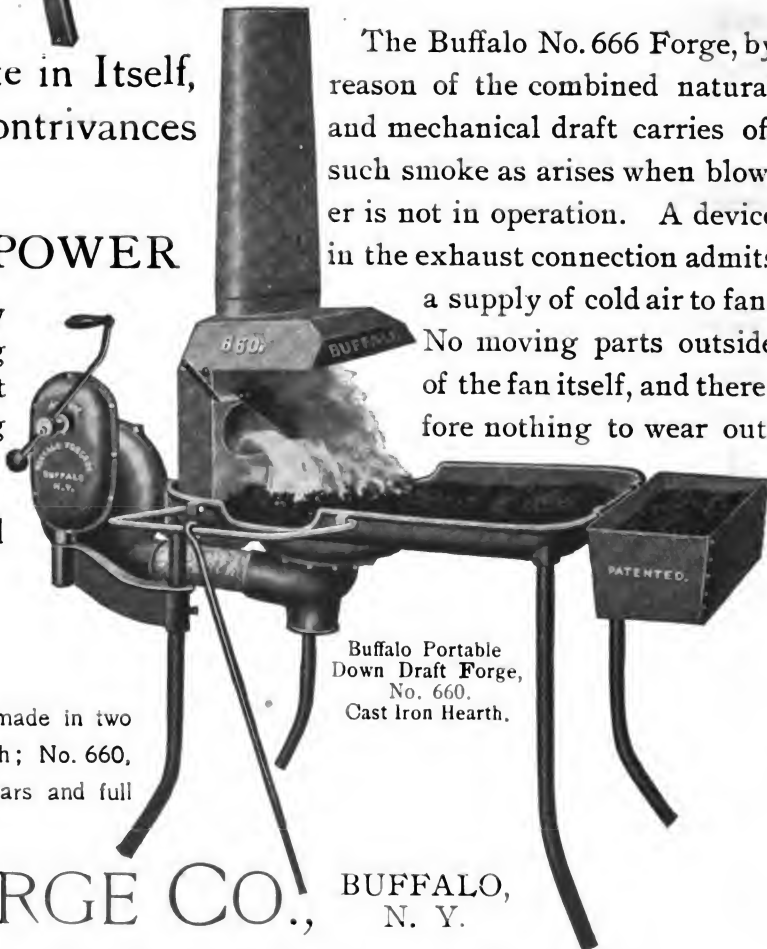
Every Forge is Complete in Itself,  
and Needs no Exterior Contrivances  
Whatever.

## NO ADDITIONAL POWER

No additional power is necessary  
to operate blower. In place of taking  
air at the fan case, blower takes it  
from over the fire, producing a strong  
draft without extra effort.

Put in a Buffalo No. 666 and  
keep the Smithy Clean,  
Cool and Light.

Buffalo Portable Down Draft Forges are made in two  
styles: No. 666 made with Steel Plate Hearth; No. 660,  
made with Cast Iron Hearth. Send for circulars and full  
particulars.



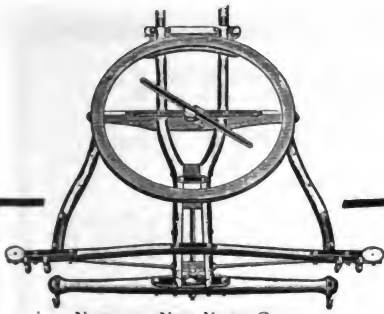
Buffalo Portable  
Down Draft Forge,  
No. 660.  
Cast Iron Hearth.

# BUFFALO FORGE CO.,

BUFFALO,  
N. Y.

THE CANADIAN BUFFALO FORGE CO., Ltd. MONTREAL.





NATIONAL NEW YORK GEAR.  
A Standard the World Over.

**WE MANUFACTURE  
A FULL LINE**

— OF —

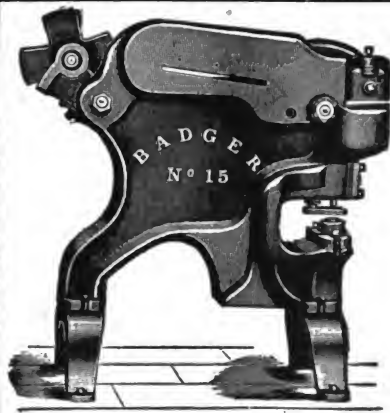
**Platform and Three-Spring  
Gears. Clipped Work  
a Specialty.**

We also manufacture HOLMAN PATENT  
COACH and CARRIAGE GEARS, Mr. Hol-  
man being in charge.

We can furnish your requirements in all  
kinds of gears—gears that are guaranteed to  
give perfect satisfaction.

Get Our Catalogue,  
Free for the Asking.

**National Gear Company,**  
50-60 Cleveland Ave., Ravenna, O.



Weight 800 lbs.

**Mr. Blacksmith :**

Here is a Punch and Shear  
that will punch and shear just  
as we say with

**ONE MAN ON LEVER.**

Punch  $\frac{5}{8}$  in. hole in  $\frac{1}{2}$  in. Iron

Shear  $4 \times \frac{1}{2}$  in. Flat Iron

"  $7 \times \frac{1}{4}$  in. Band Iron

" 1 in. Round Iron.

Write for Prices, Etc.

**Rock River Machine Co.,**

JANESVILLE, WIS. U. S. A.

**DEATH TO HEAVES! NEWTON'S**



Send for Booklet.  
\$1.00 per can, of dealers, or express prepaid.

THE NEWTON REMEDY CO., TOLEDO, OHIO.



**SPAVINOFF  
CURES**

Spavin, Ringbone, Grease  
Heel, Sweeney, Windgall,  
Enlargements, Curb, Galls,  
Sores, Pollevis, Scatches,  
ShoeBolls, &c. Removes un-  
natural growths and lame-  
ness, leaving flesh smooth  
and clean. Testimonials.

CHURCH BROS., AFTON, N. Y.

\$1.00 per Box, by Mail. For HORSES AND CATTLE.

**Save Money  
and Trouble**

In running your gas engine by  
using the No. 16 Acme, probably  
the most powerful dry battery  
made.



It produces a  
large current and  
has long life, will  
depolarize rapidly  
and is not affected  
by internal action.  
Eighteen years ex-  
perience and study  
behind it.

**THE NUNGESSER  
ELECTRIC BATTERY COMPY**

CLEVELAND, O., U. S. A.

General Sales Office, 128 W. Jackson Blvd.,

Chicago

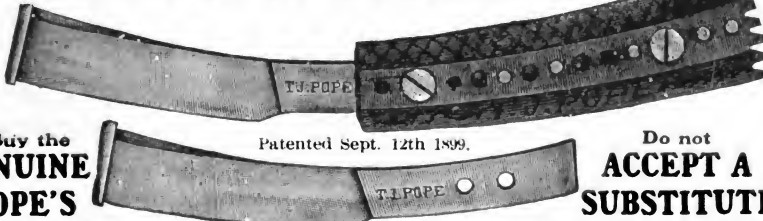
**"TOOLS THAT  
WEAR" HELLER'S CELEBRATED AMERICAN HORSE RASPS,  
FILES AND FARRIER'S TOOLS**



HELLER BROTHERS CO., Newark, N. J., U. S. A.

will save you Time and Money. Their Superior Quality sets a known and tested Standard of Excel-  
lence. All made from our own Production of Special Refined Clay Crucible Steel and tempered by a  
Secret Process. New Catalogue Mailed Free on Application.

**GENUINE POPE'S FARRIERS' KNIVES**



Buy the  
**GENUINE  
POPE'S**

Patented Sept. 12th 1899.

Do not  
**ACCEPT A  
SUBSTITUTE**

The handles of the GENUINE POPE'S KNIVES are now made with the notched end shown above. All such bear the  
maker's name, T. J. POPE. All genuine Blades are stamped PAT. SEPT. 12, 1899.

For Sale by dealers in Blacksmiths' Supplies Everywhere, SOLE AGENTS,

**WIEBUSCH & HILGER, LTD.,**

9 to 15 Murray Street,

New York.

San Francisco Office, 105 Front St., Hughson & Norton.

**IT'S NO TRICK AT ALL**

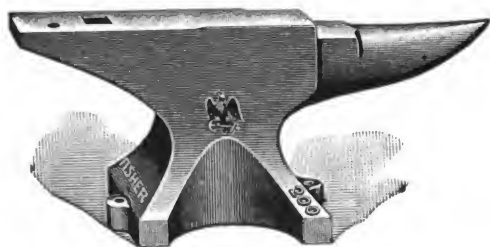
To attach a Pioneer Steel Shaft End. Repairs the shaft quickly, without unnecessary labor in fitting and  
without possibility of getting a joint that isn't a joint. Just butt the shaft up firmly against the interior



hard wood filler, and remember that the Pioneer is a double-barreled tube—that it's finished with  
an enamel that looks like patent leather and that won't come off. Give your trade something that will  
satisfy them and that you won't need to apologize for—a PIONEER, made by

**CRANDAL, STONE & CO. Binghamton, N. Y.**

BE SURE IT'S A PIONEER.

**"EAGLE"****ANVILS.**

1843

1906

**We have had over sixty years of Experience in this line and offer you the most reliable Anvils on the Market. Every one Guaranteed.**

The Face Consists of a Single Piece of the Very Best Cast Steel Perfectly Welded and of the Hardest Temper. The Horn is made of Tough Untempered Steel and will neither Break nor Bend.

**All "Eagle" Anvils made with the Latest Fisher Patent Double Thick Steel on Both Edges of the Face. Made in all Shapes and Sizes up to 1300 lbs. Weight.**

WRITE FOR INTERESTING CIRCULARS AND PRICE LIST. SENT FREE.

**EAGLE ANVIL WORKS, TRENTON, NEW JERSEY.**

**PIONEERS**

In the Manufacture of

**ANVILS AND VISES OF QUALITY**

**"Fisher" Double Screw  
Parallel Leg Vise**

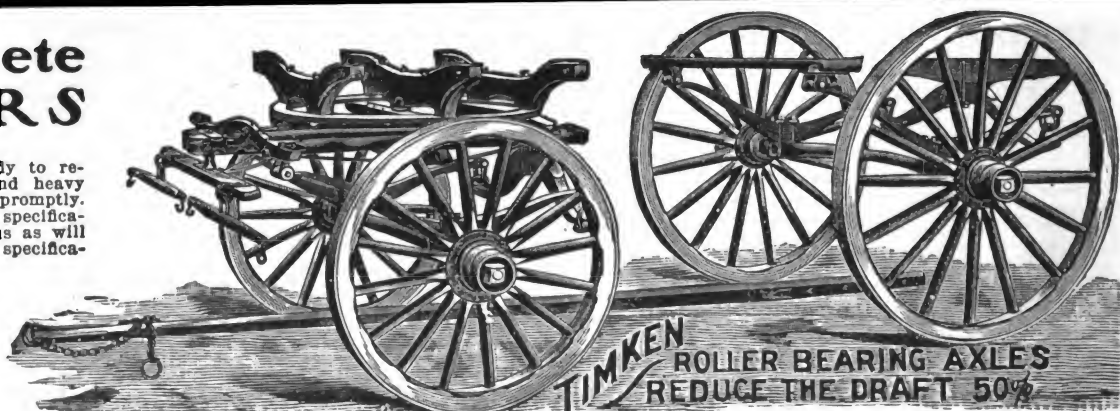
Is sold by Reliable  
Dealers Everywhere.  
For Strength and  
Durability there are  
none better made.  
The "FISHER" is  
acknowledged the  
best for Blacksmiths



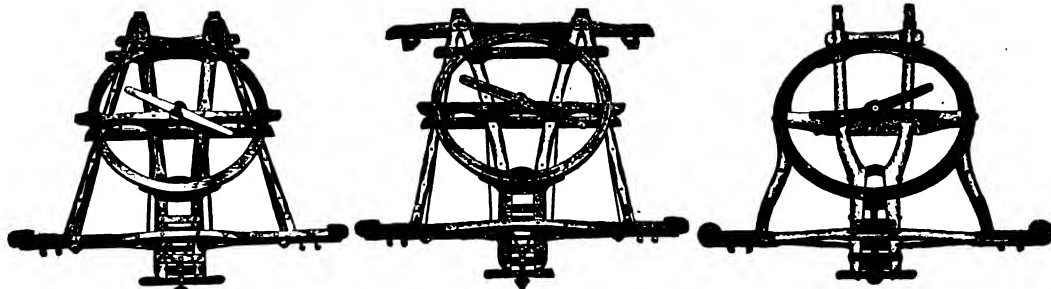
## Complete GEARS

As shown herewith, ready to receive body, for light and heavy work, can be furnished promptly. In ordering, give full specifications, or such descriptions as will enable us to make up specifications.

Also Combination  
and Three-Spring  
Gears in several  
styles.



Trussed Platform Wagon Gear Complete, Ready for Body.



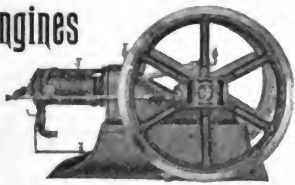
1,000 Styles and Sizes  
**"Selle Gears"**

Write for Catalogue B

**The Akron-Selle Gear Co., Akron, O., America**

## Simplicity Engines

All Sizes  
Get our proposition.  
Western Malleable  
and Grey Iron  
Manufacturing Co.,  
8-20 Chase St.,  
MILWAUKEE, WIS.

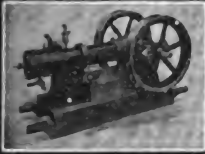


ESTABLISHED 1872

**M. L. EDWARDS CO.,**  
SALEM, OHIO.

**HAND and POWER DRILLS**  
Hub Boxing Machines, Tuyoere Irons etc.  
Catalog Free.

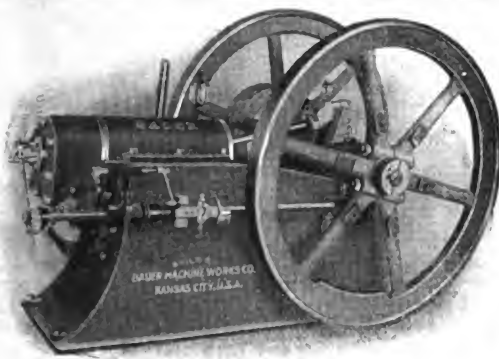
## THE "ELI" LEADS 'EM ALL THE "FOOL-PROOF" GASOLINE ENGINE



The "ELI" Gasoline Farm Engine is the only fit engine to have on a farm, where one is a good way from the repair shop. The "ELI" is so simple that there's nothing to get out of order. It will run year in and year out without the tinkering that other engines require. It is the only engine without cams, gears, and levers. We call it "Fool-Proof" because, if some simpleton or a child should monkey with it, he couldn't make it dangerous. It is absolutely safe. Isn't that the kind of an engine YOU want? Then write for our free booklet, telling how and why it is so simple and safe.

**MOLINE PUMP COMPANY, Sole Mfrs.,**

**MOLINE, ILL.**



## BAUER GASOLINE ENGINES..

The Acme of Simplicity and Perfection. If you will examine and compare, piece by piece, you will say there is no other quite so good as the "Bauer." All sizes from 1½ to 20 H.P. Write at once for free catalogue containing long list of letters from satisfied users. Our prices are also very interesting, considering quality.

THE FIRST BLACKSMITH in any town who buys of us gets the agency for his locality, a discount on his purchase, and a commission on his sales. A good engine sells readily. The Bauer is the best.

Write us Today.

**Bauer Machine Works Co.**  
115-120 W. 18th St., KANSAS CITY, MO.

## IT DOES THE TRICK! R. F. D. SPECIAL



This axle runs easier than any other, and requires no attention. "It's a Wonder." STANDARD BALL AXLE WORKS, Lancaster, Pa.

## BUILD YOUR OWN GASOLINE MOTOR

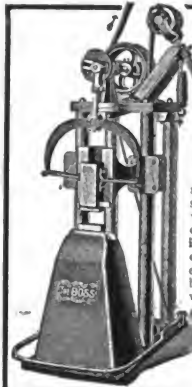


We supply the castings, drawings and all accessories. A complete line of rough castings, also finished Motors for Bicycle, Automobile, Marine or Stationary. A 2-cent stamp gets our catalogue.



**STEFFEY MFG. CO.**  
2941 Girard Ave., Philadelphia, Pa.

## NOVELTY IRON WORKS BOSS HAMMER

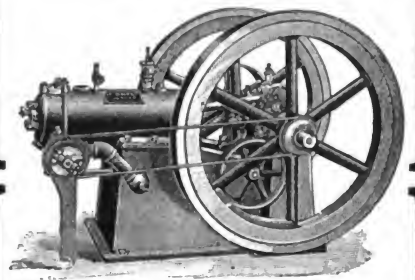


For Plow Work, Wagon Work, Heavy Work, any Work. "I use the Boss, trip hammer for all kinds of plow work that is lister stirring, plows, cultivator shovels, weed cutter and agitators, welding on axle stubs, making and drawing stone hammers and all kinds of stone cutters' tools; in fact everything that is done in a general blacksmith shop. Would not be without it for twice the cost."

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## HAGEN

### GAS AND GASOLINE ENGINES



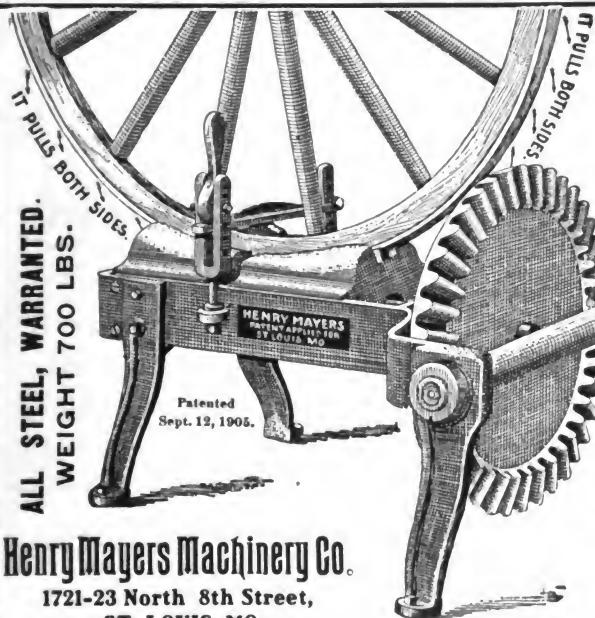
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**ECONOMICAL and RELIABLE POWER FOR THE SHOP-RUNNING BLACKSMITH and WAGON MAKER.**

HAGEN ENGINES are recommended on account of their simplicity, durability, comparatively low price, small cost of operating and the ease and certainty with which they can be controlled.

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**GAS ENGINE AND MFG. CO.**  
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The only Cold Tire Setter made in which both heads come together at same time. Grip keys set themselves.

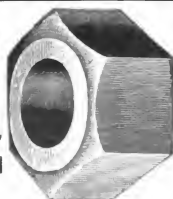
Look at every other Machine.

Note how Complicated.

You want two things, Simplicity and Power. How about it—after looking?

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No. 4. Never vary in uniformity of quality or finish.

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a two-cylinder gasoline engine superior to

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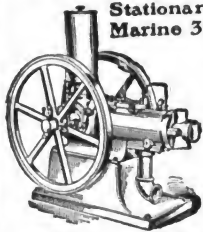
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Marine 3½ to 100 H. P.



USE KEROSENE AND  
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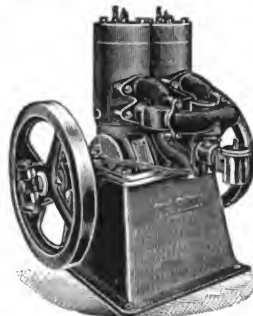
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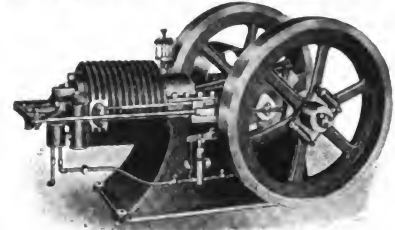
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All good ones.  
Prices right.



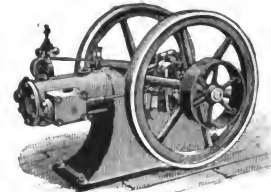
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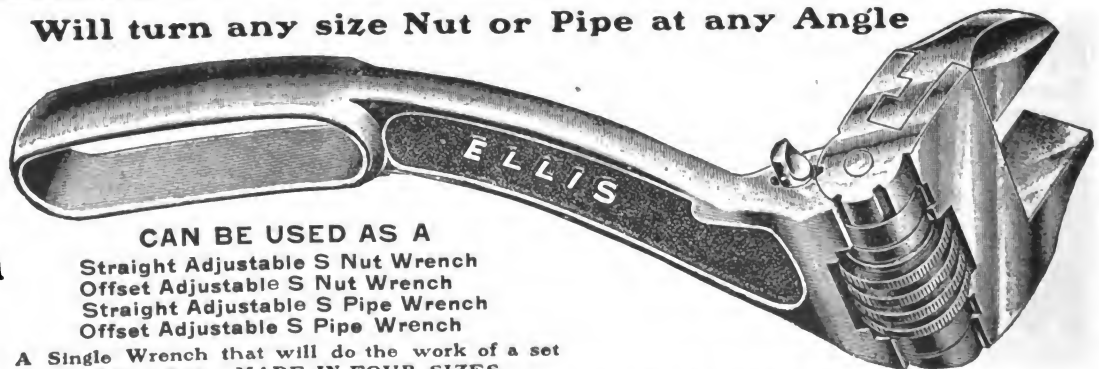
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Blacksmith's  
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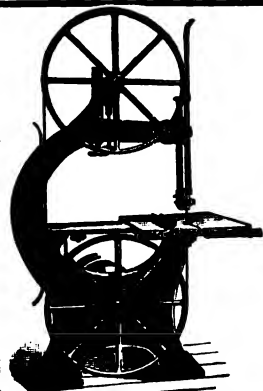
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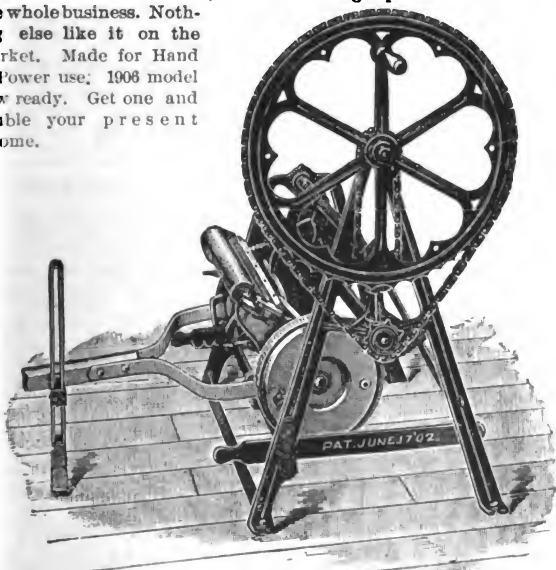
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Will enable you to grind any lawn mower with absolute accuracy in less than fifteen minutes, without taking apart. Revolutionizes the whole business. Nothing else like it on the market. Made for Hand or Power use; 1906 model now ready. Get one and double your present income.



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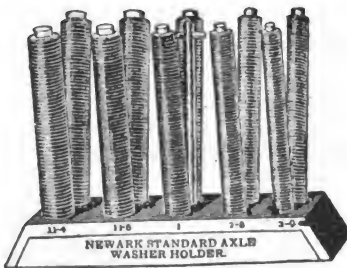


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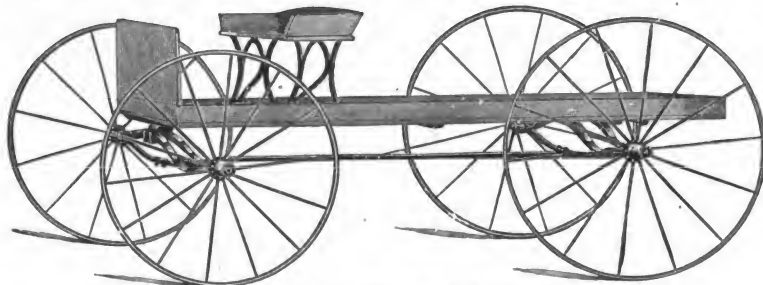
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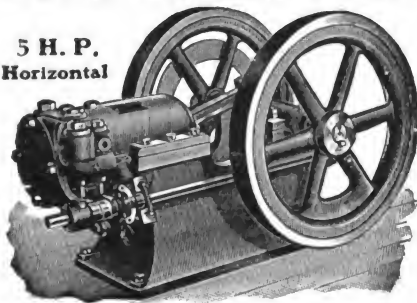


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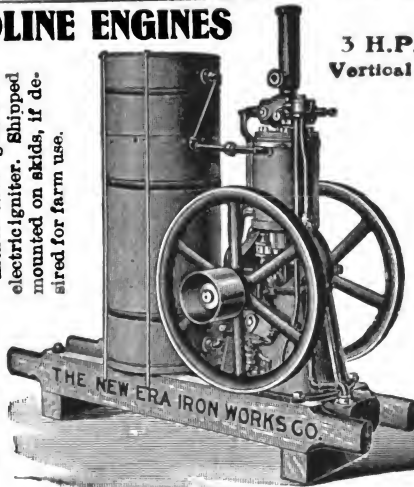
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Either tube igniter or electric igniter. Shipped mounted on skids, if desired for farm use.

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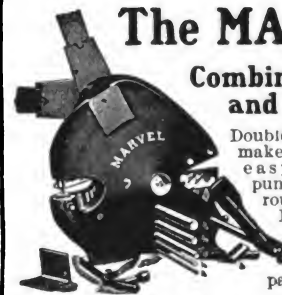
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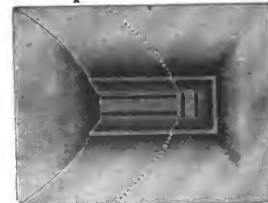


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Best Made  
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This Tuyere Iron and Fire Pot saves time, coal and money. Its no experiment. Can get a fire from 2 to 24 inches long. GUARANTEED. WHY NOT HAVE THE BEST? WILL PAY FOR ITSELF IN SHORT TIME. Ask your jobber to supply you or write us direct.

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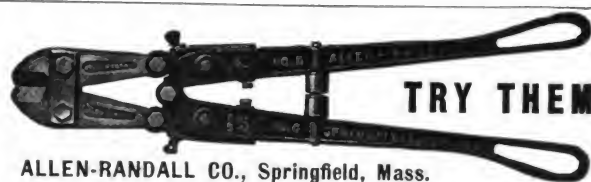
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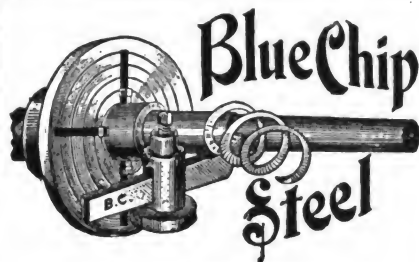
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Size of tread	Price per set for wheels with flat steel tire on and hubs bored	Price per set for wheels complete with channel and rubber tire on, and hubs bored			Add to price of wheels for axles and boxes set
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$1\frac{3}{4}$	8.25	24.00	25.00	26.00	2.25 H.P.

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PROMPT SHIPMENTS. Five set or more, one order, you  
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The desirable points in a cold tire setter are strength, endurance, quick adjustments and economy of space. Wolfe's Cold Tire Setter combines these to a remarkable degree. It occupies 2 ft. x 3 ft. floor space. It is made entirely of best open-hearth steel; it is neat in appearance, and will last a life time.

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### A COMPLETE LINE

Of all kinds of VISES, and can make  
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## INCREASE YOUR TRADE IN 1906

by buying one of these up-to-date modern machines. It means quick, efficient service to your customers. You can set their tires "while they wait." Saves time, labor and means more trade and more money to the smith.

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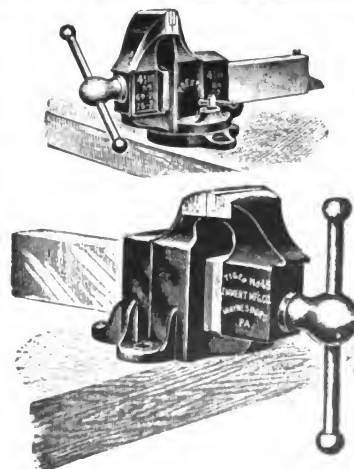
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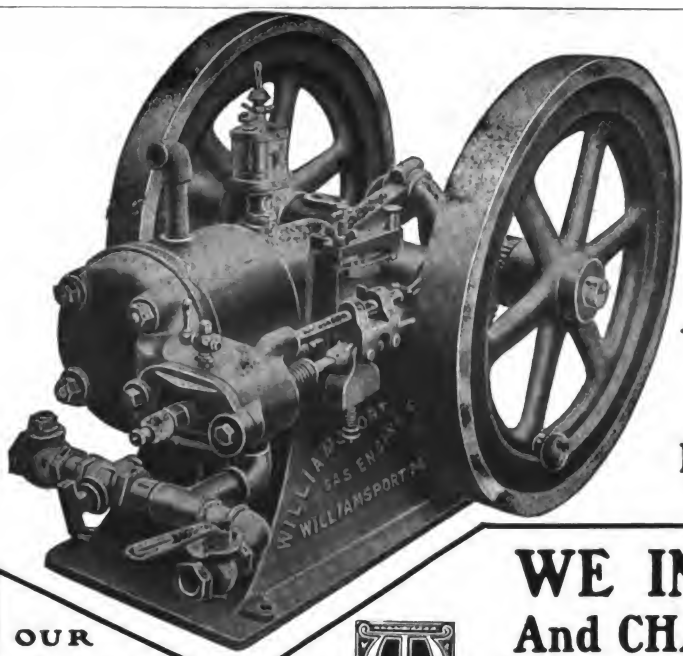
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2 to 25 Horse Power

Always Ready to Start

No Engineer Required

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The Best on the Market  
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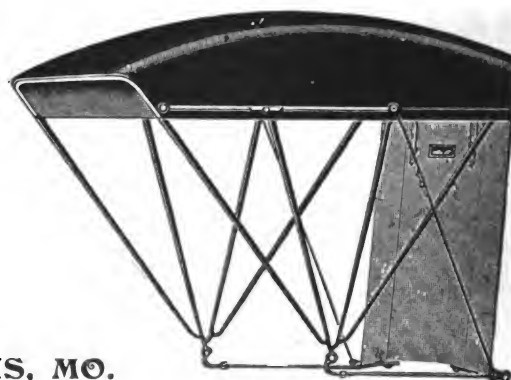
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Isn't it a fact that you often have inquiries from your customers, when they come to town for goods of this character? Why not add this to your line? We make a full line of **buggy tops, backs, cushions, storm aprons, rubber ducks, drills, spring wagon tops, etc.**

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have a reputation second to no other line on the market. We use the best of everything in their make-up, that's why they give satisfaction, they are built that way. **Send for our latest catalogue and prices.** They will interest you. **Sold to dealers only.**

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ANGLES, BARS, PLATES, SHEETS, RIVETS, PIPE,  
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Kept in stock at Cleveland for immediate shipment,  
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More of them are sold every day ten times over than all other makes combined. Each one is sold under a positive guarantee to clip faster and turn easier than any other machine made, regardless of price, or money refunded. All gearing is cut from solid metal, and unlike any other machine made, it can be turned with either the right or left hand.

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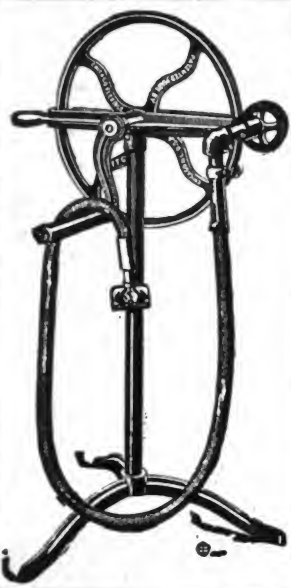
blacksmiths make using this clipper. Horse clipping is now a part of every up-to-date horse shoeing establishment. Why, look at the profit. You can clip a horse in 30 minutes with this machine, and every horse owner recognizes the advantages of clipping.

Send \$3.00 and machine will be sent C. O. D. for the balance.

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Especially for Blacksmiths and Machinists, also Hand and Power Planers and Shapers and Machinists' Supplies.

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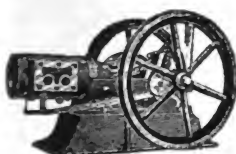


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**SHEARS  
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PUNCHES**

Hand or power, for shearing and punching plates, bars and angles. Send for Catalogue C.

BERTSCH & CO.  
Cambridge City, Ind.

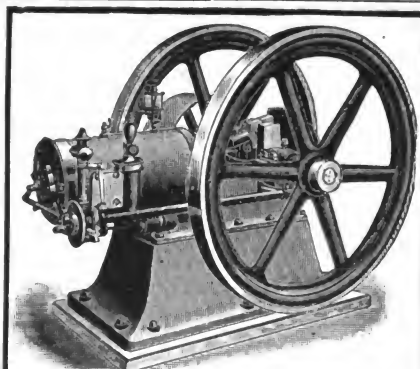
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SIMPLEST  
Engine Built****The DAVIS Engine**

Combines all Modern Improvements. The Safest, most Economical and most Reliable Power for the Shop Owner.

Davis Engines are in use every day in thirty-four states and territories in the United States, in six provinces in Canada and British America, and in many States in Old Mexico.

Drop us a postal card and we will send you free a beautiful illustrated catalogue with a full description of our Engine. Our prices will interest you. Write today.

Cascaden-Vaughan Co.,  
Waterloo, Iowa, U. S. A.



HIGHEST AWARD--GOLD MEDAL

ST. LOUIS EXPOSITION

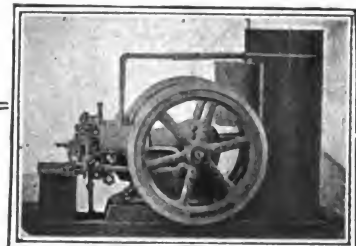
FOR

Efficiency  
Durability  
Simplicity

Write for Catalogue and Prices.

BAY STATE GAS ENGINE CO.,

48 Washington St., North,  
BOSTON, MASS.



Designed for the Our 4 H.P. Engine  
Blacksmith.

Fills every shop requirement and is always ready for business. Giving perfect satisfaction to hundreds of shop owners. Simple, strong, substantial. Best material and finest workmanship. Write for our Catalogue. Sent free for the asking. ROCKFORD ENGINE WORKS, Rockford, Ill.

## STARRETT TOOLS

THE  
STANDARD  
FOR  
ACCURACY, DESIGN, WORKMANSHIP, FINISH,

L. S. Starrett says:

"If you find any better tools than Starrett Tools—buy them."

## HACK SAWS



STARRETT QUALITY.

Complete Catalogue No. 17 AH, sent on request. You ought to have it.

THE L. S. STARRETT CO.,  
ATHOL, MASS., U. S. A.

8 YEARS  
WEAR AND  
TEAR



## Metallic Dashes

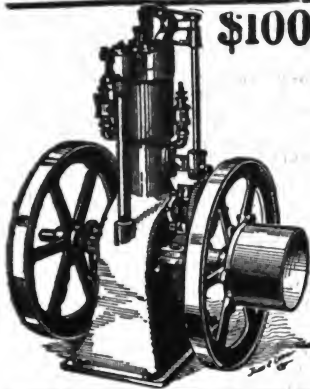
PROVE  
THEIR  
EXCELLENCE

HIGH IN QUALITY  
LOW IN PRICE  
FINISH EQUAL TO BEST PATENT  
LEATHER, BUT MORE DURABLE

For Sale by your Jobber. If not,  
write us.

Send for Catalogue.

**BENNETT MFG. CO., Hunt, N. Y. BOX 506.**



## \$100 The New Pierce Gasoline Motor IS A WONDER.

It will develop more power on less fuel  
than any other make in the world....

Built on modern lines and up to the very latest practice; made from the best material, and with ordinary care will last a life-time.

We have been building Gasoline Motors for over twenty years. More than 12,000 PIERCE MOTORS are in use in all parts of the world. We know how to, and do, build them right, in fact, we

**Guarantee Them to Give Satisfaction.  
If they do not, send them back and we  
will refund your money in full. . . .**

The PIERCE MOTORS are the best in the world and cost less than the poorest. We guarantee them against defective material for life. If you want power for any purpose, write for our printed matter, stating your needs. We also build other sizes up to 100 H. P., also Marine Motors, Launches and Auto Boats. Be sure and address

**PIERCE ENGINE COMPANY, - Dept. 12, Racine, Wis.**

3 1-2 Actual Horse Power.

## THE SINNING GAS ENGINE

Is the simplest, most durable,  
and most reliable on the market

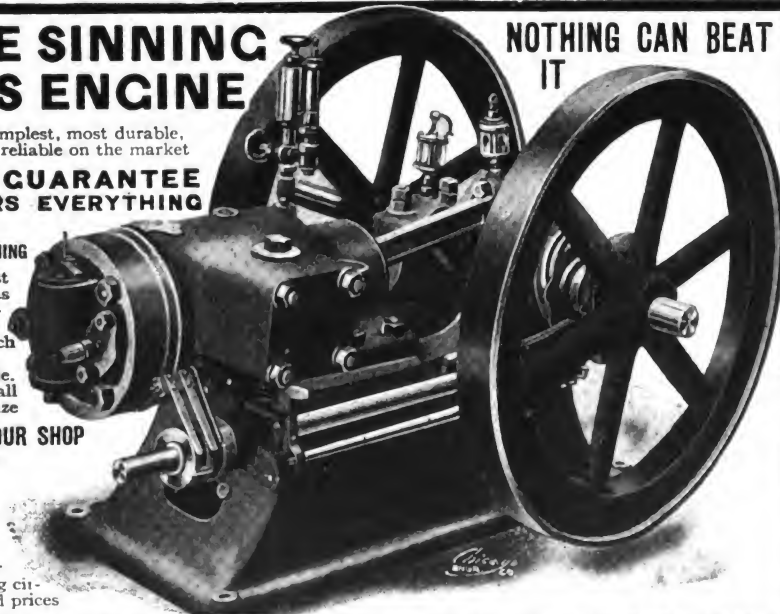
**OUR GUARANTEE  
COVERS EVERYTHING**

### THE SINNING

is cheapest  
to run, has  
few working  
parts,  
all of which  
are inter-  
changeable.  
Bearings all  
hard bronze

**EQUIP YOUR SHOP  
with the  
VERY  
BEST**

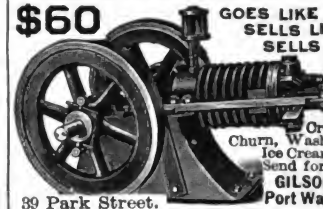
Write for  
interesting cir-  
culars and prices



**THE CHARLES SINNING MACHINE WORKS 242 DICKSON STREET  
ST. LOUIS, MO.**

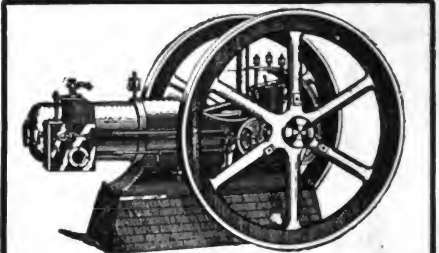
NOTHING CAN BEAT  
IT

**\$60**



**GOES LIKE SIXTY  
SELLS LIKE SIXTY  
SELLS FOR SIXTY**  
**GASOLINE  
ENGINES**  
for Pumping,  
Cream Separator,  
Churn, Washing Machine,  
Ice Cream Freezer, etc.  
Send for catalogue.  
**GILSON MFG. CO.**  
Port Washington, Wis.

39 Park Street.



Why buy an experimental gas engine, when for the same money you can buy one that has stood the test for twelve years, and have the further advantage of being able to use it either with gasoline or kerosene. Built in sizes of from 2 to 100 H.P. Write for our large catalogue and prices, if interested.

**MODEL GAS ENGINE WORKS**

Lock Box 2003, AUBURN, INDIANA

New York Office, B-21 Produce Exchange.



## A TURN FOR THE BEST

Every dealer turns profits his way when he takes on a line of

### EUREKA VEHICLES

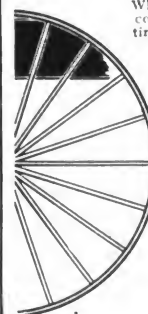
Everything that goes into them is the best we can buy or make. This means that your customers will be pleased with them. You will get compliments instead of complaints.

Easy to sell because quality is high and prices are low. Profitable because quickly sold on liberal margin.

Write to us and let us tell you.

**NEW EUREKA CARRIAGE AND HARNESS CO.  
CINCINNATI, OHIO.**

Wheels in the white or finished complete, with or without rubber tires. Buggy Tops in all sizes, grades and prices.



**LOOK UP**



## ONLY ONE TO A CUSTOMER

AT THIS SPECIAL LOW SAMPLE ORDER PRICE



**\$50.00** buys a RUBBER TIRED BUGGY. Fine Leather Top. Tires Warranted.

RUBBER TIRED RUNABOUT for only **\$40.00** Quality, Material and Workmanship Fully Guaranteed. At These Special Prices f.o.b. Cars, Cincinnati.



REFERENCES:—Bradstreet's or Dunn's Mercantile Agency. All inquiries promptly answered. Write for catalogue and information.

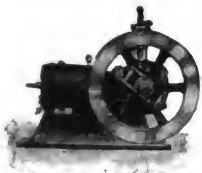
## The Hickory Carriage Company

(INCORPORATED)

MAKERS OF STANDARD GOODS

SOUTH STREET

CINCINNATI, OHIO



The 1906  
**CUSHMAN**  
3 H. P. 150 lbs.  
6 H. P. 225 lbs.  
Simple, Durable.  
Free Catalogue.  
CUSHMAN MOTOR CO.,  
Lincoln, Neb.

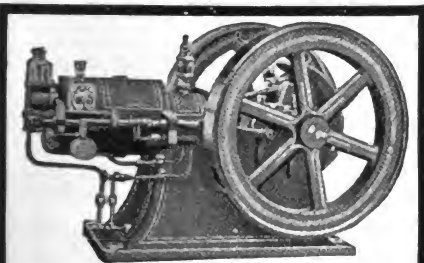


**Igniter Dynamos**  
For all Classes of  
**GAS ENGINES**  
for make and break or jump  
spark systems. Our latest type  
price \$15. Write for circular of  
magneto, etc.  
**THE CARLISLE & FINCH CO.**  
243 E. Clifton Ave.  
Cincinnati, O.



To Gas Engine Operators.  
Dynamo Ignition.  
**Motsinger**  
**Auto-Sparker**

No battery to start or  
run. The original speed-  
controlled friction-drive dynamo. Driven  
parallel with engine shaft. No belts. No beveled  
pulley or beveled fly wheel necessary. For make  
and break and jump-spark system. Water and  
dust proof. FULLY GUARANTEED.  
We have an attractive proposition for the Dealer  
in Gas Engine lines. Correspondence solicited.  
Write for 32-page catalogue, FREE.  
**MOTSINGER DEVICE MANUFACTURING CO.**  
33 Main Street, Pendleton, Ind., U.S.A.



**RELIABLE POWER**

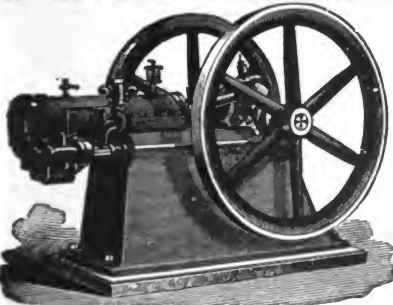
New model and Michigan gasoline engines  
for blacksmith and machine shop work.  
Every part guaranteed and illustrated in our  
catalogue, which is sent free to those in-  
terested.

We make a very favorable price on the first  
engine in any locality and the best of terms  
for agents who sell and advertise our engines.

Our book called "Proof Positive" tells how  
our engines are being used and where we  
have replaced other engines with ours. 2 to 6  
horse power. Get catalogue today. Nothing  
like them on the market.

The Nation Engineering Co., Saginaw, Mich.

**COLUMBUS** GASOLINE  
ENGINES  
ARE THE THINGS FOR BLACKSMITHS



Send for Catalogue 33, Stating Horse  
Power You Need.

**COLUMBUS MACHINE COMPANY**  
Columbus, Ohio.

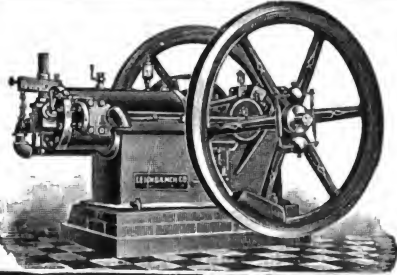


**CYCLONE**  
PORTABLE  
**FORGE**

The Cyclone Portable Forge, shown here, is a favorite every-  
where. Suitable for heavy, as well as light work. Has a 28x40  
in. hearth, large capacity coal box and a 14 in. fan. The deep  
firebox and powerful blast make the Cyclone Style No. 0 capable  
of doing the heaviest kind of work. The Cyclone has double  
Ratchet, Adjustable Legs, Solid Frame, Detachable Lever hung  
on Ball Joint and swinging in chilled seat. FULLY GUARAN-  
TEED.

Write today for our FREE Catalogue and SPECIAL INTRO-  
DUCTORY PRICES.

**FOOS MANUFACTURING CO.,**  
28 Sheridan Ave. SPRINGFIELD, OHIO.



**Lennox Gasoline Engines**  
MADE IN ALL SIZES.

Built especially for Blacksmith shop  
power. It means money in your pocket to  
find out about our engines before placing your  
order.

WRITE AT ONCE FOR NEW FREE CATALOGUE.

**Lennox Machine Company,**  
110 9th Ave., MARSHALLTOWN, IA.

**Perfect Cooling with Small Water Supply**

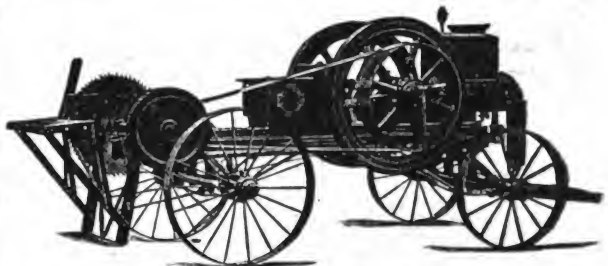
Attractive proposition, isn't it?  
This is only one of the many  
SPECIAL features found on the

**"EASY STARTING"**  
**LAUSON LINE.**

5, 6 and 8 H.; P. Self-Contained  
Hopper Cooler. 6 to 20 H. P. with  
Improved Screen Cooler.

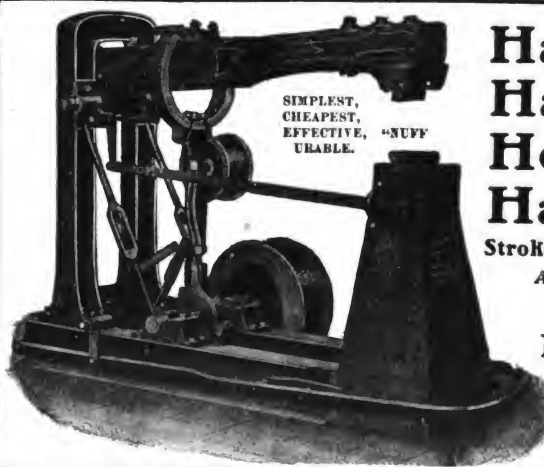
Write for 1905 Catalog and Deal-  
ers' Discounts. Mention this  
paper.

STATIONARY and PORTABLE,  
with or without Saw Attachment.



"LAUSON" SPECIAL, with Saw Attachment.

**THE JOHN LAUSON MFG. CO., New Holstein, Wis.**



**Hathorn's**  
**Hard-hitting**  
**Helve**  
**Hammer.**

Stroke adjustable while running.

Ask your dealer or write to

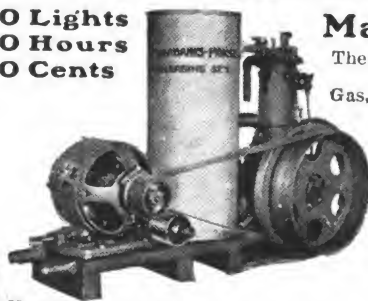
**HATHORN**  
**FOUNDRY &**  
**MACHINE CO.**  
GRINNELL,  
IOWA.

10 Lights  
10 Hours  
10 Cents

**Make Your Own Light**

The FAIRBANKS-MORSE Electric Light Outfit gives  
plenty of good light at a moderate cost.

Gas, Gasoline or Kerosene Engines for all purposes,  
from 2 h. p. up.



Cut out complete advertisement and send to  
**Fairbanks, Morse & Co.,**  
Monroe St., Chicago, Ill.

Please send me Illustrated Catalogue No. C 487  
Gasoline Engines.

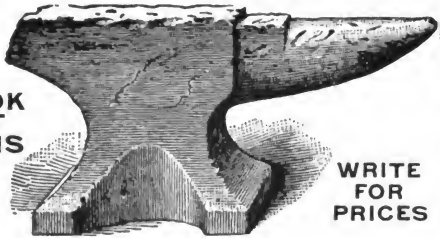
I may want..... h. p. to run.....

Name..... Street No.....  
Town..... State.....

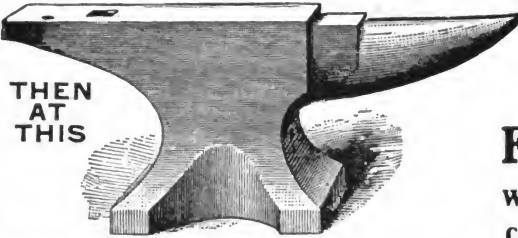


**NO MATTER HOW BADLY THEY ARE BROKEN WE CAN REPAIR THEM IN GOOD SHAPE**

LOOK  
AT  
THIS



THEN  
AT  
THIS



WRITE  
FOR  
PRICES

**Columbus  
Anvil and  
Forging Co.,**

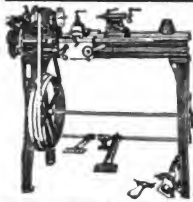
West Frankfort St.,  
COLUMBUS, OHIO.

**WE ARE EXPERTS AT REPAIRING OLD WROUGHT ANVILS.**  
WE ALSO MANUFACTURE THE CELEBRATED ARM AND HAMMER BRAND ANVIL.

ASK YOUR DEALER FOR THEM.

## HONEST DEALINGS

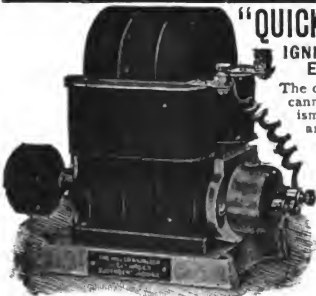
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## FOOT AND POWER LATHES 9 TO 15 IN. SWING.

We also make Wood Lathes from 6 in. to 14 in. swing. If you are in the market for any tools, our catalog will be mailed free to any address. Shall we mail you one?

**Carroll-Jamelson Machine  
Tool Co.  
Batavia, Ohio.**



## "QUICK ACTION"

**IGNITING DYNAMOS  
Excel All Others!**

The only generator that cannot lose its magnetism. For either make and break, or jump spark work. Also spark coils. Send for Catalogue B.

**The  
Knoblock-  
Heideman  
Mfg. Co.,  
SOUTH BEND,  
IND.**

**Badger**

*"The world's standard for efficiency"*

**BADGER GASOLINE ENGINES  
Turn Time Into Money**

Badger Engines enable the blacksmith to make the most money out of his time by enabling him to do more, better and a greater variety of work, and at the same time employ less help—saving cost of helpers.

The "Badger" stands for superior excellence and efficiency the world over. Badger Engines are easy to start and to keep going; cost almost nothing for repairs and last a life-time. They are as cheap as is consistent with best skilled workmanship.

Send at once for our Fine Book, Illustrated in colors—It's FREE. It tells all about Badger Gasoline Engines, and why they are the best on earth for the Blacksmith. Write today, before the books are gone.

Special discount to Blacksmiths who take an agency. Write for attractive terms.

**C. P. & J. LAUNSON,  
103 W. Water St., Milwaukee, Wis.**

3

**SEBASTIAN LATHES are Good Lathes**

Catalogue Free. Sizes 9, 10, 12, 15 inches.

Our engine lathes are provided with both screw and rod feeds as well as power cross feed. Gears to cut all standard threads from 5 to 36 are furnished. Steady and follower rests, large and small face plates and countershaft go with each Lathe. Foot Lathes, Tools and Supplies.

**SEBASTIAN LATHE CO.  
124-126 Culvert Street, CINCINNATI, OHIO.**

**TIRE SHRINKER**

**TIRE BENDER**

**FOR PROGRESSIVE BLACKSMITHS**

**IDEAL**

WRITE FOR DESCRIPTIVE CIRCULARS  
**THE WEYBURN CO.  
ROCKFORD, ILL. U.S.A.**

**IDEAL**

**PLOW SHARE AND OTHER STEEL SHAPES. BLAKESLEY TUVRE IRON.**

## THE WATERLOO BOY

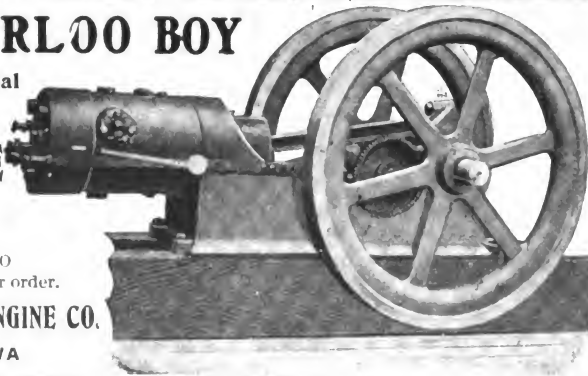
Our Blacksmith's Special  
3½ to 4 H. P.

## GASOLINE ENGINE

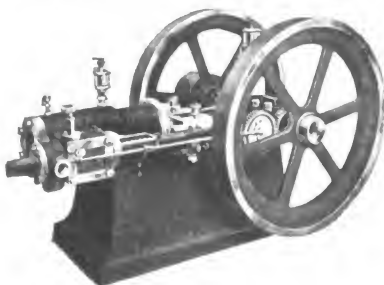
The Engine Is Right!  
The Price Is Right!

Investigate the WATERLOO  
before placing your order.

**WATERLOO GASOLINE ENGINE CO.  
WATERLOO, IOWA**



## THE ROBERTSON STRAIGHT-LINE GAS AND GASOLINE ENGINES



See that **CROSS-HEAD** and **SLIDE**, making a **STRAIGHT-LINE PISTON**, relieving the cylinder of all undue wear and strain. No escape of power. This feature adds many years' life to the engine.

**Can you think of anything better in Gas Engine Construction?**

Built in sizes 4 to 16 single cylinder and 16 to 30 double cylinder. Attractive offer. Write stating size.

**MADE BY The Robertson Mfg. Co. BUFFALO N. Y.**

## WE WANT AN AGENT

In every city and town to sell

**BEECHER**

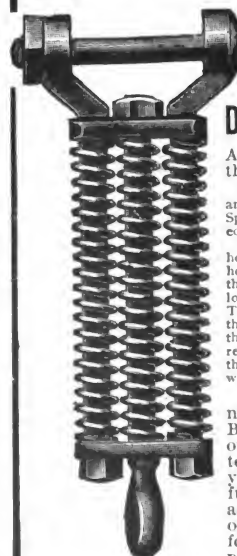
**Draught Springs.**

All wagon owners need them.

For simplicity, durability and usefulness, our Draught Springs simply cannot be equalled.

They act as a cushion to the horses' shoulders, they HELP horses START heavy loads, they assist in drawing the load after it is in motion. They prevent collar wounds; they save from twenty to thirty per cent. in harness repairs; prolong the life of the team and increase their working capacity.

We now have a large number of successful Blacksmiths acting as our agents—we have territory for more. Will you represent us? We furnish sample springs and printed matter to our Agents. Write us for our liberal agency proposition.



**BEECHER DRAUGHT SPRING CO.  
NEW HAVEN, CONN.**





No. 8 REGULAR HEAD.—Exact size.

**"NEW STANDARD" HORSE NAILS**

The letter "S" appears on the head of each nail.



No. 8 CITY HEAD.

Exact size.

**Best Nail in the World BAR NONE.**

**DEALERS' NET PRICES TO SHOERS.**

No.....	5	6	7	8	9	10	11	12
Box....	\$4.75	4.00	3.75	3.50	3.25	3.25	3.00	3.00
Lb.....	.19	.16	.15	.14	.13	.13	.12	.12

FOR SALE BY ALL DEALERS.

Uniform Horse Nails. In length, breadth, thickness, blades, points, quality and PRICE, and the best driving and holding nail ever produced.

We mean every statement made above.

Manufactured and Guaranteed by

**STANDARD HORSE NAIL CO., New Brighton, Pa.**

**Your Hack Saw Troubles**

will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



**West Haven Manufacturing Co.**  
NEW HAVEN, CONN.

**NATIONAL SELF-OILING STEEL TUBULAR AXLES**

Now made of high carbon steel.



Guaranteed to be stronger and more rigid than solid steel axles. We make both. Write us

**National Tubular Axle Co., ENIGSVILLE, PA.**



**ATTENTION!**

We want you to represent us in your locality selling

**The Victory Corn and Feed Mills.**

Oldest and Best Grinding Mill Made. **STRONG, SIMPLE, DURABLE.** Especially adapted to grinding ear corn, shelled corn, wheat, oats, rye, etc. Write for Prices and Particulars today.

**THOMAS ROBERTS,**  
(Established 1876.) **Springfield, Ohio.**

**ELECTRIC FORGE BLOWERS**

**EXCEL ALL OTHERS**

A GOOD BLOWER THAT BLOWS EVERY BODY GOOD



Write for Prices and Circulars

MODERN MACHINERY MAKES THE SMITH'S WORK LIGHTER

**ROTH BROS. & CO.**  
27-29 So. Clinton Street,  
CHICAGO, ILL.



**MY LATEST BOOK**  
**ARTISTIC HORSESHOEING**

SHOULD BE IN EVERY UP-TO-DATE SHOP.

**THE PROGRESSIVE SMITH**

will find it invaluable in his every day work. A practical, scientific treatise on improved methods of shoeing. Special directions given for correcting faulty action in trotters and for shaping shoes to cure different foot diseases. 284 different styles of shoes illustrated and explained. **Cloth bound, 217 pages, Price \$2.00.**

—AGENTS WANTED.—

**Prof. GEORGE E. RICH, 239 S. Main St., AKRON, OHIO.**

**CARPENTER'S NEW FULL MOUNTED DIE SETS**

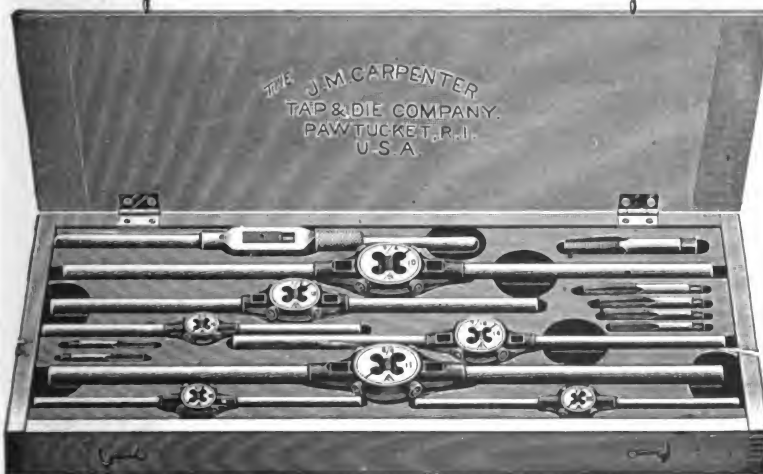
With a stock for each die and the Original Nichols Tap Wrench.

Before buying a die set you should see **Carpenter's** and you will have no other make.

Send for catalogue

**The J. M. Carpenter Tap & Die Co.**

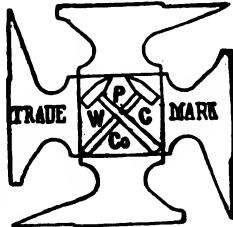
Pawtucket, R. I., U. S. A.



**YOU WILL NEVER FAIL**

*To Make a Strong, Clean Weld If You  
Use Perfection Welding Compound.*

We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



Perfection Welding Compound will do the trick quickly and neatly. It makes a stronger weld than any other compound manufactured, as proven by the tests it has undergone. Send for free sample.

PRICE CONSISTENT WITH QUALITY.

**PERFECTION WELDING COMPOUND CO., SCRANTON, PA.**

**DOES IT PAY**

TO STOCK UP WITH  
LOW PRICED TOOLS?

**STERLING  
HACK SAW BLADES**

ARE NOT THE LOWEST IN PRICE BUT THEY ARE  
**THE CHEAPEST** FOR YOU FOR YOUR CUSTOMERS.

**BECAUSE,** MADE FROM THE HIGHEST GRADE OF STEEL THAT MONEY CAN BUY. MADE WIDE AND HEAVY.  
*There's a purpose in this. It costs us money.*  
COSTS YOU NO MORE THAN LIGHTER THINNER BLADES.

**DIAMOND SAW & STAMPING WORKS,  
BUFFALO, N.Y. U.S.A.**

ATALISA, Iowa, Jan. 14, 1906.

BUFFALO FORGE CO.,

Buffalo, N. Y.

Gentlemen:

Mr. Hallock directs me to order another No. 666 Buffalo down draft portable forge. I have been working on the first one and must say it is the best I have ever seen. Please ship at once.

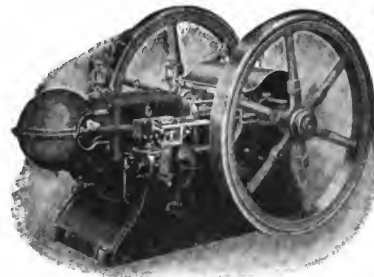
Yours truly,

S. Hallock,

(per J. Disbrowe.)

**LIGHTNING BALANCED**

**GAS and GASOLINE ENGINES**



**Are Especially  
Suited for  
Blacksmith Shop  
Power.**

Write for Free Catalogue.

**KANSAS CITY HAY PRESS CO.,**

482 Mill Street,

KANSAS CITY, MO.

INVESTIGATE THE

**Hercules Hydraulic**

**Before  
You  
Buy a  
Tire Setter**



**National Machine Co.**

KEOKUK, IA.

**Henderson Hand Power TIRE SETTERS**

Set Tires Cold.  
Keep the Dish right  
Tighten Wood Work  
Pull Broken Spokes  
Jump In New Spokes  
Are Money Makers



**Standard Tire Setter Co.**

KEOKUK, IA.

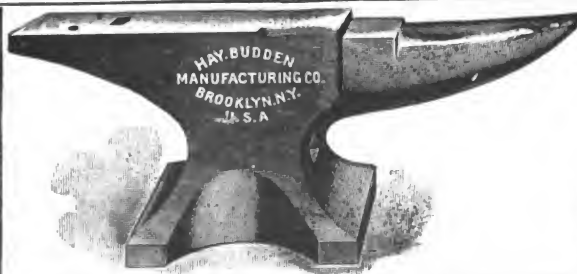
**HAY-BUDDEN SOLID WROUGHT ANVILS**

**The Gold Medal Anvil  
Highest Award**

OMAHA, 1898 PAN-AMERICAN, 1901

Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS.



OVER 100,000 IN USE

**WARRANTED**

Experience has proved their worth and demonstrated that "HAY-BUDDEN" Anvils are Superior in Quality, Form and Finish to any on the Market.

**HAY-BUDDEN MFG. CO., BROOKLYN, N. Y.**

# AMERICAN BLACKSMITH

A Practical Journal of Blacksmithing and Wagonmaking

BUFFALO  
N.Y. U.S.A.

MARCH, 1906

\$1<sup>00</sup> A YEAR  
10<sup>0</sup> A COPY

## THE TIRE SETTING SEASON IS COMING

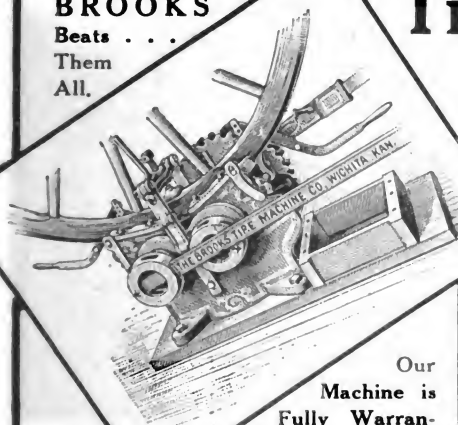
Are you doing the tire setting in your locality? The business follows the **BROOKS**. The trade comes to the well equipped, up-to-date shop, with improved machinery . . .

### THE BROOKS

Is built by the oldest manufacturers of Edge Grip Cold Tire Setters in the United States and receives highest award wherever shown. Used in the Government Shops on account of their demonstrated superiority over every other make. . . .

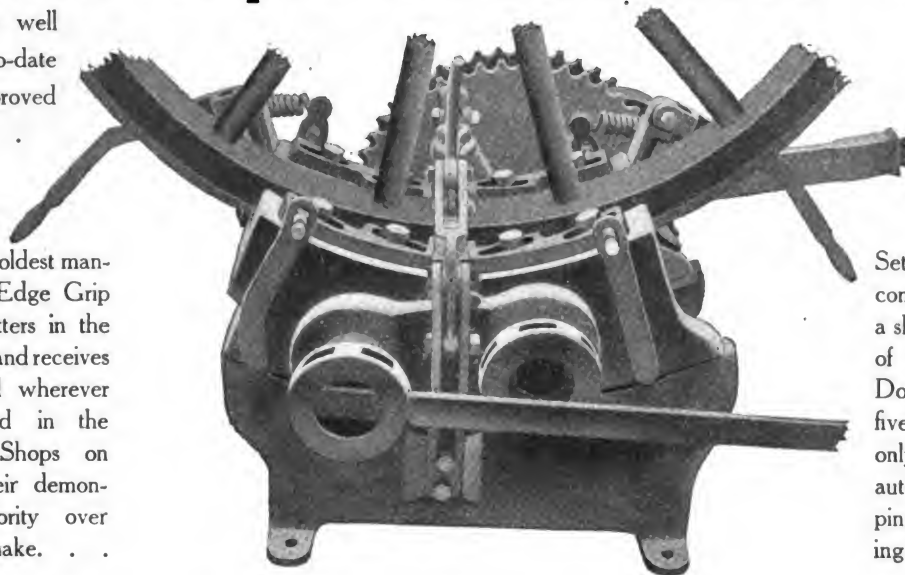
### THE BROOKS

For Rapid and Accurate Work the **BROOKS** Beats . . . Them All.



Our Machine is Fully Warranted and is sold on easy terms. Write now.

## GET A Brooks Improved Tire Setter



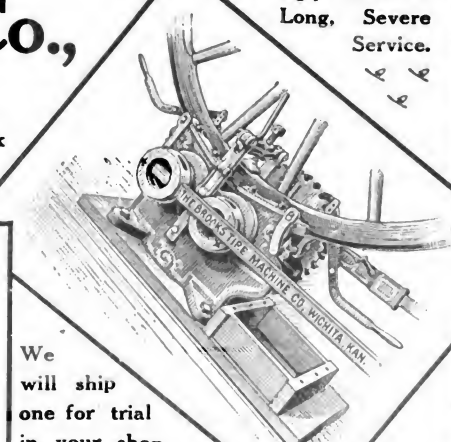
Are you prepared for Spring Trade? Have you a **BROOKS**? This machine is now making money for thousands of wise shop-owners and will do the same for you. Let us send one on trial. . . .

### THE BROOKS

Sets all sizes of tires by compressing the metal in a short space. No need of removing the bolts. Does the work in two to five minutes. It is the only machine that has an automatic device for gripping the tire and preventing the keys from slipping.

### THE BROOKS

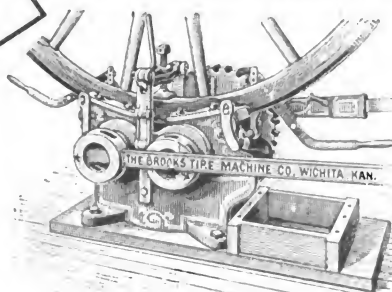
A Compact Machine Strongly Built for Long, Severe Service.



We will ship one for trial in your shop, without cost to you. Write us today. . . .

## The Brooks Tire Machine Co., WICHITA, KAS., U. S. A.

A Handy Vest Pocket Memorandum Book sent Free for the asking. Also get our Descriptive Circulars Free.



# CARRIAGE MAKER and BLACKSMITH TOOLS

## THE "ELITE" BLOWER

is correctly manufactured  
and is designed to  
meet the demands of  
hard service, together  
with the greatest  
possible efficiency,  
durability  
and convenience.

IT'S A  
MONEY  
MAKER.



Fig. 900, 12 inch.

Manufactured by

THE  
SILVER MFG. CO.

365 BROADWAY  
SALEM, OHIO  
U. S. A.

Hub Boxing Machines, Spoke Tenon Machines, Band Saws, sizes 20, 26, 32 and 36 inch, Forges, and a complete line of hand and light Power Drills, a 19-inch Post Drill and a 20-inch Round or Square Base Drill with Lever or Screw Feed. The last two drills are used extensively by Carriage Builders and others.

THESE ARTICLES  
ARE  
GUARANTEED  
AS  
REPRESENTED.

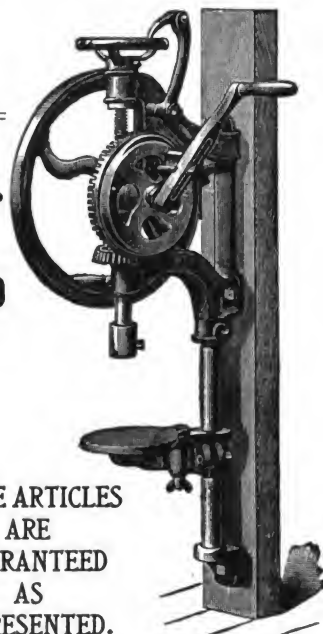


Fig. 731, No. 1.

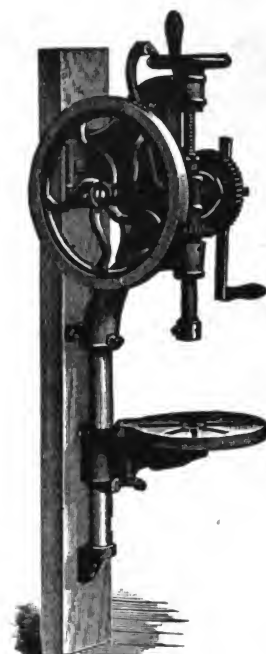


Fig. 742, No. 12.

Special prices are extended to Carriage Makers and Smiths  
if this paper is mentioned.

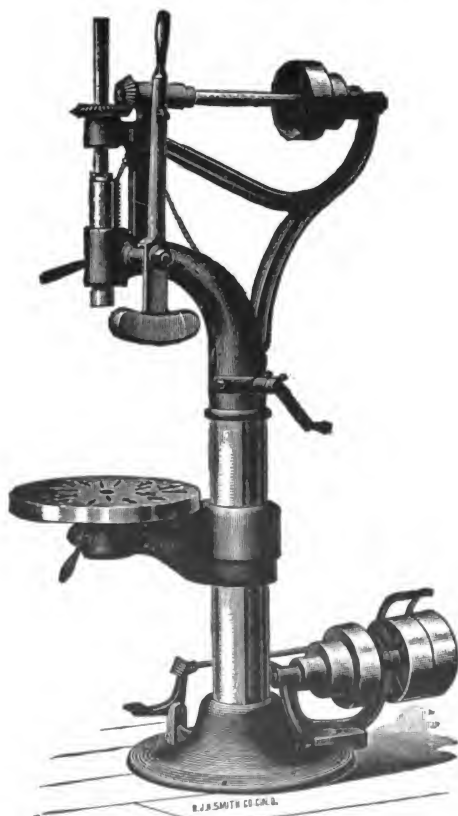


Fig. 850, 20 inch.

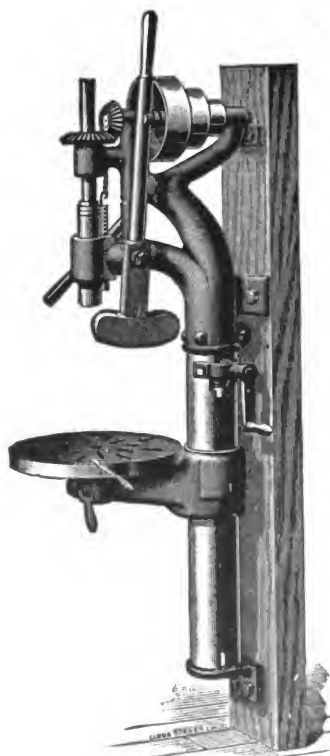


Fig. 727, 19 inch.

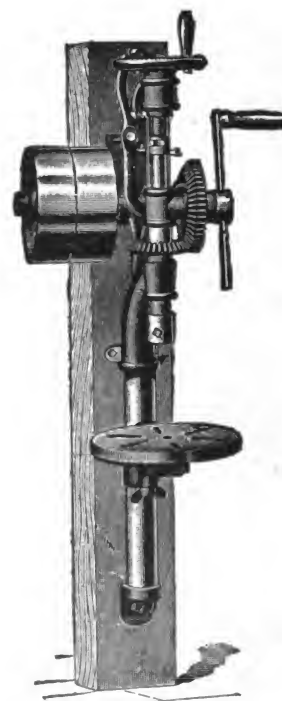
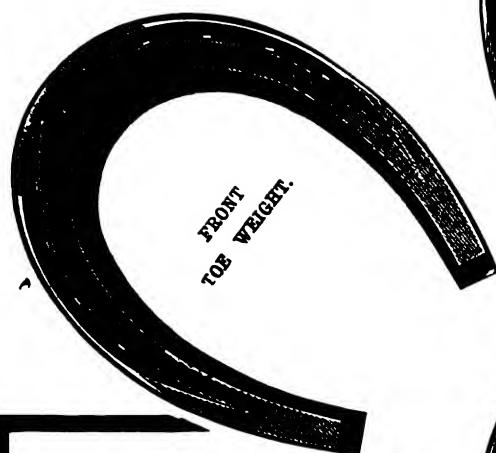


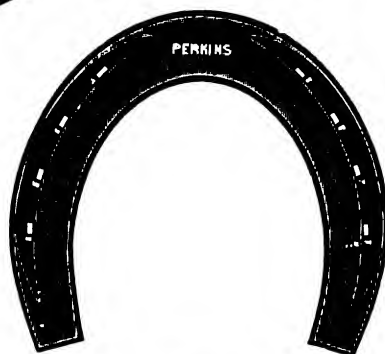
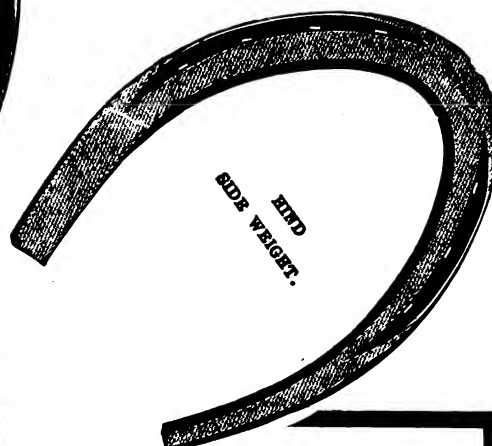
Fig. 746, No. 12.



★**PERKINS**★  
HORSE SHOES  
AND  
TOE CALKS  
THE STAR BRAND



★**PERKINS**★  
HORSE SHOES  
AND  
TOE CALKS  
The **SUPERIOR** Kind



**PERKINS**  
**SHOES**

Have more points of superiority than any other make. An up-to-date shoe for up-to-date Blacksmiths. .

OUR  
Complete Catalogue  
**SENT FREE**  
For the asking.  
Write today.

**PERKINS**  
**SHOES**

Are acknowledged by all users to have no equal. Made in all Styles and Sizes. Sold at Reasonable Prices.

Send  
for Samples New  
Pattern Front  
Extra Light and Light.  
Free for asking.



**PERKINS**

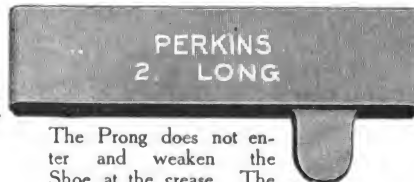
Made in Medium and Long, both blunt and sharp. Packed in 25 lb. boxes.



The Steel (our own make) is best suited for Calks; welds with sand and wears well. Perfectly graded in Length and Size.

**TOE CALKS**

Chisel Pointed Prong. These cuts show exact size of No. 2. **SAMPLES SENT FREE.**



The Prong does not enter and weaken the Shoe at the crease. The only slightly curved Calk sold.

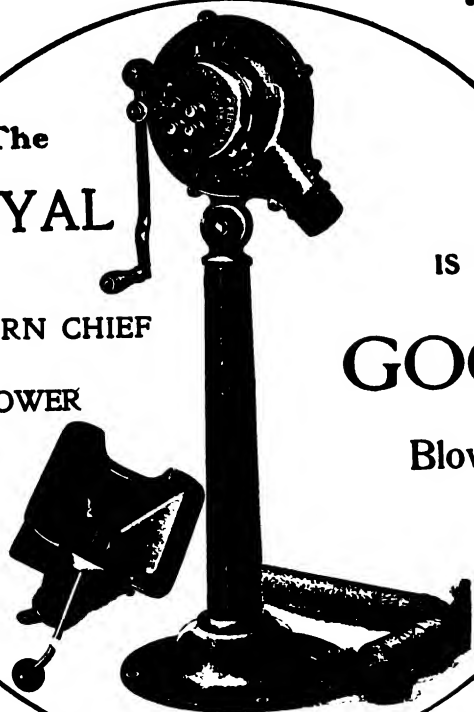
—MANUFACTURED BY—

**RHODE ISLAND PERKINS HORSE SHOE COMPANY**  
**PROVIDENCE, RHODE ISLAND.**

# THREE GOOD THINGS

"ASK THE DEALER."

The  
**ROYAL**  
WESTERN CHIEF  
BLOWER  
IS A  
**GOOD**  
Blower



## ROYAL BLOWER

Crank turns right or left.  
Its operation is easy and noiseless.  
Blast is powerful. After-blast lasting.  
Gears and Boxes are phosphor bronze and steel.  
No spiral or worm gears.  
Fan, 12 inches. Weight 100 lbs.  
Fire-pot measures 9x11½x4 in. inside.

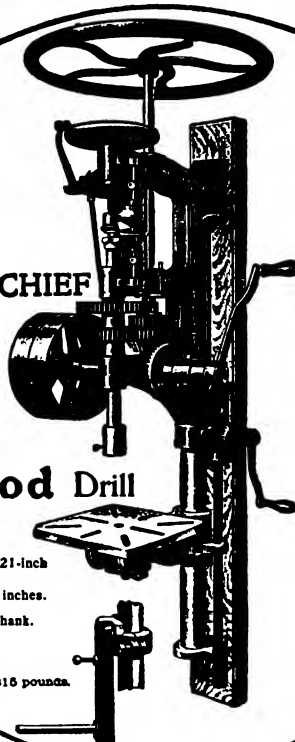
## No. 14 DRILL.

This Drill has set the pace for all.  
It simply does everything itself.  
Seems to have brains.

THE  
WESTERN CHIEF  
DRILL  
No. 14  
Is a Good Drill

Drills to center of 21-inch Circle.  
Bores from 0 to 1½ inches.  
Takes Bits ½ or ¾ Shank.

Weight, 815 pounds.



It has independent quick return by means of which the operator can rapidly withdraw the bit at will, without stopping or reversing motion of machine. Or it can be set to drill any depth desired and will automatically (whether running by power or hand) reverse itself, withdraw the bit, and start drilling again and again indefinitely; all without stopping the motion of machine, or turning it backward. This feature is independent of Drill, and need not be used unless desired.

It has mechanical device for raising and lowering the table.

The  
**Royal**

No 100

Forge

Is a  
Good

Forge



Hearth, 33½x46 inches.  
Fan, 12 inches.  
Height, 50 inches.  
Weight, 275 pounds.  
Length over all, 64 inches.

No. 100 ROYAL FORGE—An all-around Forge for the lightest and heaviest work.

We have about one hundred other "GOOD THINGS" in the way of Forges, Blowers and Drills for you to select from.

## CANEDY-OTTO MFG. CO.

CHICAGO HEIGHTS, ILL.



# SOME OF OUR BARGAINS

## HAYSLE FTTED PLOW SHARES.



FITTED WITH  
BOLTS READY  
TO BOLT ON  
THE PLOW.



We carry these **Fitted Shares** for all the leading plows in use throughout the country. **Exact duplicates of the original.** Made from highest, grades of **crucible and soft center steel, thoroughly finished, correctly fitted and ready to apply.** We are now manufacturing about one hundred different numbers and adding new ones constantly.

Special plowshares made to order, any quality or style. Send for estimates.

These shares are **guaranteed** to fit the plows for which they are **intended** wherever the shares made by the plow company will fit.

**Soft center steel is not guaranteed against breakage.**

### Bement.

No. BG—14 in.

### Canton.

No. 50—10 in.  
No. 110—16 in.  
No. 42A—14 in.  
No. 46—12 in.  
No. 54A—16 in.  
No. 112—14 in.  
No. 66—12 in.  
No. 128—14 in.  
No. 62—9 in.  
No. 64—10 in.

### Rock Island.

No. 40—16 in.  
No. 30—12 in.  
No. 32—14 in.  
No. XI—14 in.  
No. 38—14 in.

### Defiance.

No. 97—14 in.  
No. 92—16 in.

### Deere.

No. 13—12 in.  
No. 31—12 in.  
No. 33—14 in.  
No. P33—14 in.  
No. 42—14 in.  
No. 46—16 in.  
No. 637—9 in.  
No. 049—10 in.  
No. 038—11 in.  
No. 059—12 in.

No. 40—16 in. *Rider.*  
No. 40—16 in. *Walker.*

### Cassaday.

No. 517—16 in.  
No. 515—14 in.

### Fuller & Johnson.

No. 16X—16 in.  
No. 14X—14 in.

### Kingman.

No. A16—16 in.  
No. S314—14 in.  
No. S316—16 in.

### Sattley - Hummer.

No. 186—16 in.  
No. 69—16 in.  
No. 182—14 in.  
No. 181—12 in.

### Emerson.

No. N14R—14 in.  
No. N16R—16 in.  
*Gang.*  
*Sulky.*

### J. Thompson & Son.

No. 16T—14 in.  
No. 16T—16 in.

### Oliver.

No. Crescent 8—16 in.  
No. Crescent 8—14 in.  
No. 7—12 in.  
No. ND1—12 in.  
No. ND2—14 in.

### Gale.

No. A12—12 in.  
No. A14—14 in.  
No. A16—16 in.

### Moline.

No. FSD1—12 in.  
No. SD1—12 in.  
No. FDI—14 in.  
No. DI—14 in.

No. T9—9 in.

No. T10—10 in.  
No. T12—12 in.  
No. T14—14 in.  
No. F. D. 9—15 in.  
No. F. D. 11—16 in.  
No. H116—16 in.  
No. D10—16 in.  
No. FD18—18 in.  
No. FALDI—14 in.

*Alfalfa.*  
No. FALDI—16 in.

*Alfalfa.*

### Solid Comfort.

No. 134—14 in.  
No. 138—16 in.

### Peru.

No. AL—14 in.  
No. AL—16 in.

### Bradley.

No. L33—12 in.  
No. L45—14 in.  
No. L70—16 in.

### Reliance.

*Janesville.*  
No. 3R—16 in.  
No. 2R—14 in.  
No. 38—14 in.

### Case.

No. AS—12 in.  
No. AN—12 in.  
No. AS14L—14 in.  
No. AS16L—16 in.  
No. AS—14 in.  
No. AP—14 in.  
No. AS—16 in.  
No. AP—16 in.  
No. AS—18 in.

## PRICES.

12-inch Crucible Steel, each..... \$1.40  
14-inch Crucible Steel, each..... 1.50  
16-inch Crucible Steel, each..... 1.60

Soft Center Steel, each..... \$1.95  
Soft Center Steel, each..... 2.20  
Soft Center Steel, each..... 2.40

## Haysler Blacksmith's Plow Shares.



With heavy upset shin that is unapproachable, the heaviest, smoothest shin in the market; runs way down close to point;

no double shin shares are needed. See illustration. Upper corner is filled full and

smooth. New improved and best shape. They are all drawn under a triphammer, refining the grain of steel along the cutting edge, giving added wear and absolute satisfaction. Made from high-grade crucible steel, solid cast and genuine laid soft center steel. We carry both right and left hand and in following sizes.

### Narrow Stirring Plow Shares.

	Solid Cast.	Crucible.	Soft Center.
10 in. 5½ inches wide, each	\$.42	\$.53	\$1.20
11 " 5½ " " "	.42	.53	1.20
12 " 5½ " " "	.45	.53	1.20
14 " 6 " " "	.55	.66	1.35
16 " 6 " " "	.65	.75	1.50
18 " 6 " " "	.85	1.00	1.75

### Wide Stirring Plow Shares.

	Solid Cast	Crucible.	Soft Center.
12 in. 6 inches wide, each	\$.48	\$.58	\$1.20
14 in. 6½ " " "	.58	.70	1.35
16 in. 6½ " " "	.68	.80	1.50
18 in. 6½ " " "	.90	1.10	1.75

### Plain Breaker Shares.

	Solid Cast Steel.	Soft Center Steel.
12 in. 6½ inches wide, each	\$.60	\$1.80
14 in. 6½ " " "	.70	1.50
16 in. 6½ " " "	.80	1.75
18 in. 6½ " " "	1.00	1.95

We can also furnish Rod breaker shares on any of the above sizes made of 3-16 inch steel, by shipping from factory direct. If in need of anything not listed above, kindly write us.

**Our No. 63 Bargain Catalogue containing 180 pages of rock bottom prices on every kind of plow goods and blacksmiths' supplies is now ready for YOU. It's free.**

**Write for one today.**

# HAYSLE IRON COMPANY

## KANSAS CITY, MO.





NORTH WESTERN  
HORSE NAILS  
PATENTED  
CHICAGO

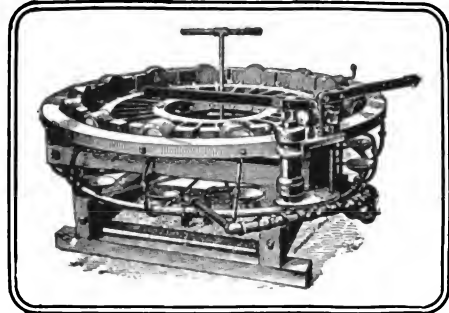
FOR  
STRENGTH  
SAFETY  
AND  
QUALITY OF MATERIAL.

**Northwestern Horse Nails**  
**ARE THE BEST ALL AROUND**

The most perfect in form and finish. Made of the best Swedish Iron. Will hold a shoe longer than any other nail made. Note the re-enforced point—makes it easiest to drive and the safest to use.

**UNION HORSE NAIL CO., CHICAGO, ILL.**

## The West Hydraulic Tire Setter



Is a **Round Machine** for tiring **Round Wheels**, and compresses the tire at all points—not all in one spot—and the compression is so slight at any particular point that tire bolts do not have to be removed when resetting an old tire, neither are holes closed so bolts are tight in tire. Wheel is made compact and joints tight.

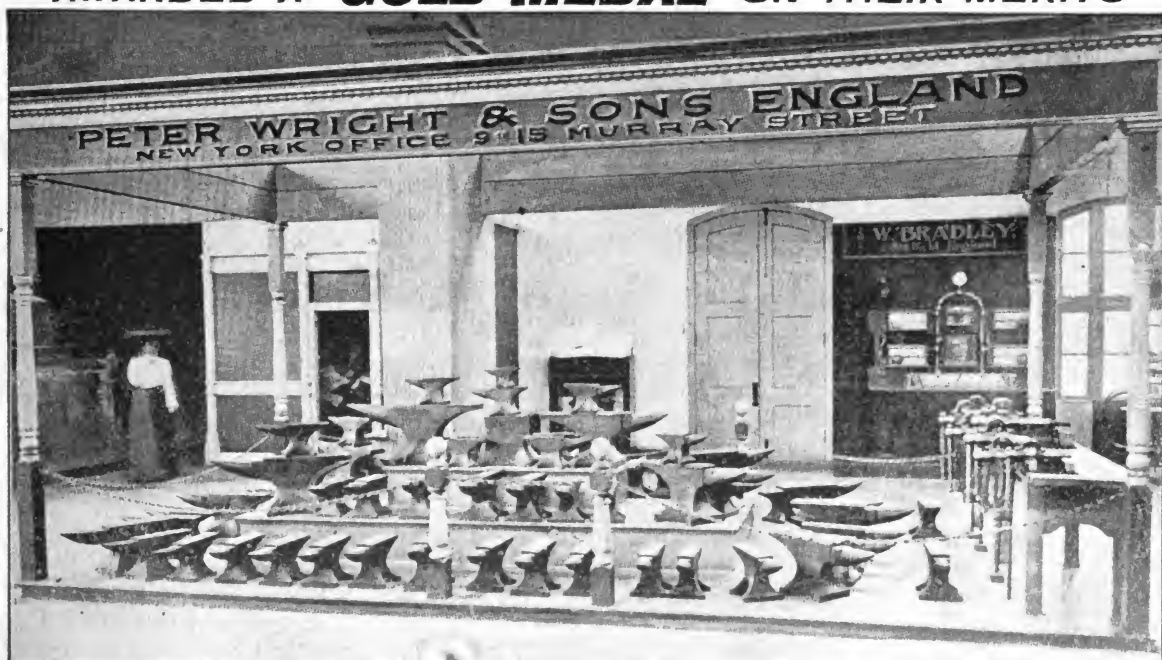
**WRITE US YOUR REQUIREMENTS.**

**The West Tire Setter Company**

**ROCHESTER, N. Y.**

## PETER WRIGHT AND SONS ANVILS

**RANK ABOVE ALL OTHERS. AT THE LOUISIANA PURCHASE EXPOSITION THEY WERE  
AWARDED A "GOLD MEDAL" ON THEIR MERITS**



OUR EXHIBIT AT ST. LOUIS, UPON WHICH WAS BESTOWED HIGHEST AWARDS BY THE EXPOSITION JURY

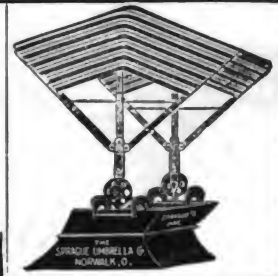
**WIEBUSCH & HILGER, Ltd., 9-15 Murray Street, New York City.**



## What COL. SPRAGUE Makes.

Wagon Umbrellas,  
3-Bow Tops,  
Carriage Canopies,  
Auto Tops, Lawn Canopies,

**MADE THE SPRAGUE WAY.**



Send for Catalogues.

THE SPRAGUE UMBRELLA CO., Norwalk, Ohio.

## GAS OR GASOLINE POWER

When produced by an I. H. C. Engine is unquestionably the best and most economical power obtainable

Every manufacturer, shop or mill owner, or power user of any kind, is interested in the cost of power, for ordinarily it represents the burden of expense in his business. The cost of power from an I. H. C. Gas or Gasoline Engine, however, is reduced to the minimum, only about one-tenth of a gallon of gasoline per horse power per hour being consumed.

With an I. H. C. Engine there is no delay in firing up—no waiting for Steam.

IT IS ALWAYS READY FOR WORK

AND IT ALWAYS WORKS

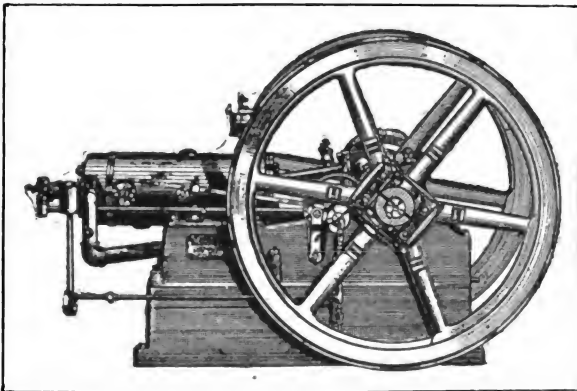
Simplicity in design is a strong feature in the construction of the I. H. C. Engine. Thus it is possible for any person with ordinary intelligence to operate this engine. It is so simple that it does not require an engineer—additional evidence of its great economy as a power producer over the steam engine.

SAVE MONEY, SAVE TIME, SAVE LABOR

by using I. H. C. Gas or Gasoline Engines, for any purpose requiring power within their rated capacity.

I. H. C. Engines are made in the following styles and sizes: Horizontal, Stationary and Portable—4, 6, 8, 10, 12 and 15 h. p. Vertical—2, 3 and 5 h. p.

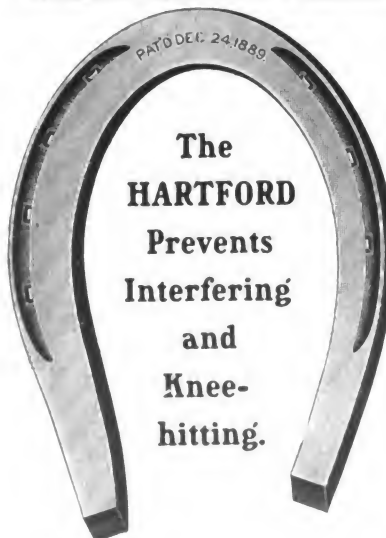
Our catalog explaining the advantages derived from the use of I. H. C. Engines will be mailed upon request.



## International Harvester Company of America

(Incorporated)

No. 7 U Monroe Street, Chicago, Ill.



## Do You Use the Best Side Weight

## And Toe Weight Shoes

Made in this Country?

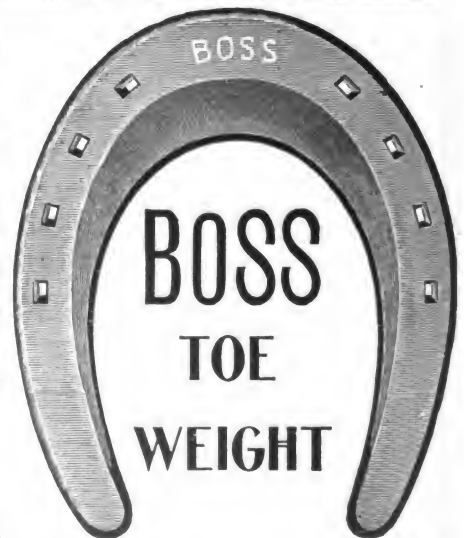
## BOSS AND HARTFORD SHOES

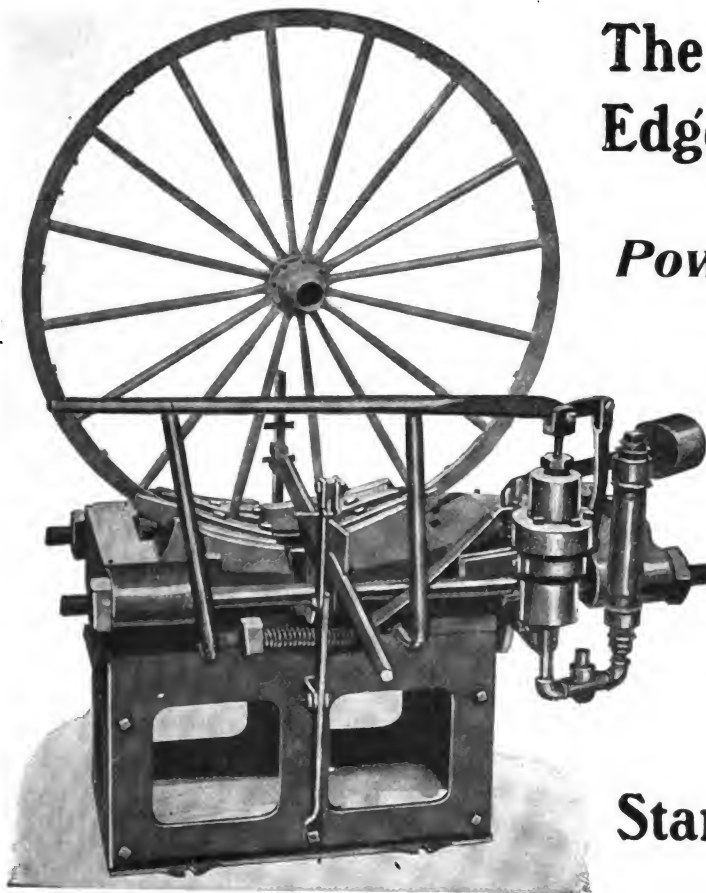
have the highest reputation among the trade. Cost same as inferior makes, mean less labor. Are far superior to a hand made shoe. Carried by all Leading Jobbers.

SEND FOR CIRCULARS.

Sample pair of either size or weight mailed post paid on receipt of 50 cents.

**THE SIDE-WEIGHT HORSE SHOE COMPANY,**  
Mechanic St., HARTFORD, CONN.





## The Scientific, Hydraulic Edge Grip Cold Tire Setter

Sets tires cold by a few strokes of a

### *Powerful Hydraulic Pump*

#### The Warranty Tells the Tale.

It is warranted to work as well in every respect, or better, than any other edge grip tire setter and in addition is warranted to work much

#### EASIER AND QUICKER.

These are two most valuable points in a hand power cold tire setter.

Its gripping jaws grip the tires accurately and let go quickly without the use of hammer.

After setting over 400 tires Mr. Brown writes as follows:

WORTHAM, Texas, February 3, 1906.

Gentlemen—In reply to your letter concerning the Scientific Tire Setter, will say that it is the easiest and quickest cold tire setter I ever saw operated. A man can set tires faster than one man can take them off and roll them in the shop and roll them out and put them on.

Yours truly,

T. L. BROWN.

Will you buy a machine if it will work as fast as Mr. Brown says it will?

For full information, address,

## Standard Tire Setter Co.

KEOKUK, IOWA

# GREEN RIVER DRILLS

AA (No. 734).

## LAST A LIFE-TIME

They cost but a little more than the cheap article.

The "GREEN RIVER" Drill is built for wear and long service.

Fully Guaranteed.

Write for New Catalogue No. 33 and see full description.

MADE BY

## WILEY & RUSSELL MFG. CO.,

Greenfield, Mass., U. S. A.

Also Screw Plates, Taps, Dies, Bolt Cutters and Shoeing Vises.

No. 744.

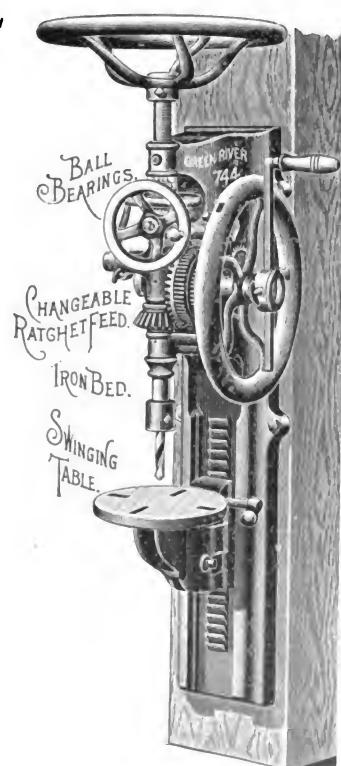




PLATE PATTERN.



## WHY ARE CAPEWELL HORSESHOE NAILS

### The Best in the World ? ? ? ?

FOR THE FOLLOWING REASONS:

Capewell Nails are made from the BEST MATERIAL that can be found in the markets of the world, selected, prepared and inspected specially for our use—from the mines through the rolling mill. At our works the ROD IS SUBJECTED TO THE MOST EXACTING CHEMICAL AND MECHANICAL TESTS to prove its quality. It is worked by a process controlled by this Company exclusively, which insures absolute UNIFORMITY OF TEMPER and increases the ELASTICITY, TOUGHNESS AND HOMOGENITY OF THE METAL. It is the purpose of this Company that Capewell nails shall be always "The Best Horse Nail in the World," and NO EXPENSE IS SPARED BY THE MANAGEMENT, OR DETAIL SLIGHTED by our experienced, capable and loyal force of employees which will contribute to that result.

PLAIN PATTERN REGULAR HEAD.

PLAIN PATTERN CITY HEAD.

Made by **The Capewell Horse Nail Company**  
HARTFORD, CONN.

The Largest Manufacturers of Horse Shoe Nails in the World.

#### BRANCHES

New York: . . . 103 Beekman St.	Chicago: . . . 238-240 Randolph St.
Philadelphia: . . . 323 Arch St.	St. Louis: . . . 12-14 North 12th St.
Baltimore: . . . 6 East German St.	New Orleans: . . . 736 Union St.
Buffalo: . . . . . 11 Ellicott St.	Denver: . . . . . 1611 Blake St.
Cincinnati: . . . . . 720 Main St.	San Francisco: . . . 636 Mission St.
Detroit: . . . . . 29-31 Farrar St.	Portland: . . . 554 Worcester Block.
Mexico City: . . . Apartado, 2377	Toronto, Canada: . . 50-56 Duke St.

CORRUGATED PATTERN.





# Buffalo 200 Blower

"PRIDE OF TODAY'S SMITHY"

Five Year's Protection against Repairs.

Built on Modern Mechanical Principles.



Gearing Used on Buffalo Nos. 200 and 201 Blowers.

Canadian friends: Save duty, buy of The Canadian Buffalo Forge Company, Montreal, Quebec.



Buffalo No. 200 Blower and H. H. Tuyere as now furnished with every machine. Crank turns in the direction of arrow.

The Simplest Blower made—no adjustment needed. That is done once for all by expert mechanics in our own factory.

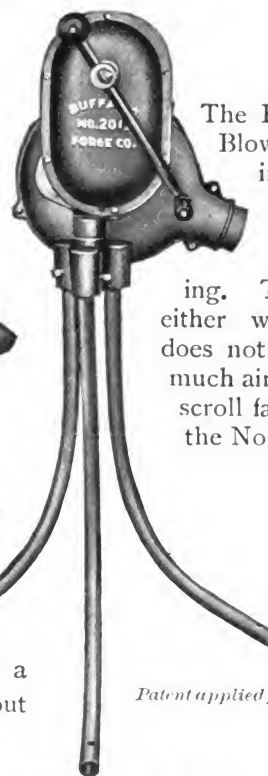
The Most Durable Blower—look at the gears, strong, large and heavy. No watch-case mechanism can stand a five year guarantee.

The Lightest Running Blower—our scroll fan case is the correct scientific one and gives more air per revolution with less power than any other form.

The Sturdiest Blower—no racking twisting or battering strain can put it out of business. Gears are held in a cast iron box frame with extra length bearings.

The Busy Man's Blower—oil it once a month and it is always in perfect condition. Gears run in oil in an air tight dust proof case.

Patent applied for.



The Buffalo No. 201 Blower is identical in every respect with the No. 200 except the form of fan casing. The crank turns either way but blower does not deliver quite as much air as the standard scroll fan casing used on the No. 200 Blower.

Patent applied for.

The Buffalo Nos. 200 and 201 Blowers are guaranteed to be more durable and easy running than any other blower on the market. They are sold under a positive guarantee for five years. Any part wearing out within that time will be replaced free of cost.

PLACED IN YOUR SHOP  
FOR FREE TRIAL.

Copy of our latest illustrated Catalogue cheerfully sent on request.

**BUFFALO FORGE COMPANY**  
BUFFALO, N. Y.

Buffalo No. 201 Blower  
furnished with H. H. Tuyere.

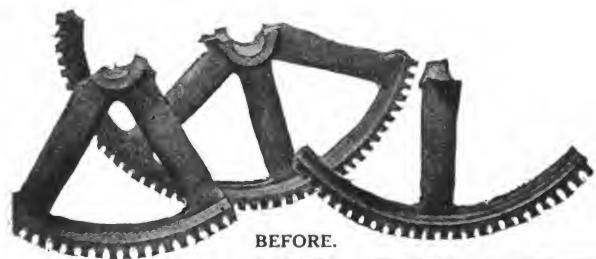


The Class of Work that  
**WELDARINE**

TRADE **WELDARINE** MARK.

WILL DO.

AN EYE OPENING  
PROPOSITION  
TO  
**BLACKSMITHS  
MACHINISTS**



BEFORE.



AFTER.

## AND REPAIRERS OF MACHINERY

With **WELDARINE** you can braze any casting that you can get hot and make it as good as ever without patches of any kind.

With **WELDARINE** you can braze cast-iron or any form of iron or steel, cast-iron to steel or cast-iron to copper.

**WELDARINE** can be used successfully in an ordinary forge or with a brazing torch.

There is not a shop, manufacturing plant and scarcely a household in which there is not some broken cast-iron article which the owner would have repaired if it could be done neatly and at a moderate price.

**WELDARINE** at once opens up a new and **PROFITABLE** field for anyone who will cultivate it. Let it be known that you can braze cast-iron; braze a few pieces and the knowledge of it will soon get around and bring you a continually increasing amount of work.

**WELDARINE** is one of the most practical of recent discoveries and will become as staple in the blacksmith shop as sugar in the household. Sold under a positive guarantee to give perfect satisfaction by the following Jobbers:

### ALABAMA

American Supply Co. . . . . Mobile  
Cunningham Hardware Co. . . . . Mobile  
Phillips, Yarbrough & Allen . . . . . Opelika

### COLORADO

Dillon Hardware Co. . . . . Denver

### FLORIDA

S. B. Hubbard Co. . . . . Jacksonville  
McMurray & Baker . . . . . Jacksonville  
Knight & Wall Co. . . . . Tampa  
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### GEORGIA

Beck & Gregg Hardware Co. . . . . Atlanta  
J. B. Hightower Hardware Co. . . . . Atlanta  
W. M. Spratlin . . . . . Atlanta  
William Beach Hardware Co. . . . . Columbus  
Mallery Mill Supply Co. . . . . Macon  
Williams Buggy Co. . . . . Macon  
King Hardware Co. . . . . LaGrange  
Edward Lovell's Sons . . . . . Savannah  
Hartfelder-Garbutt Co. . . . . Savannah  
J. D. Weed & Co. . . . . Savannah

### ILLINOIS

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Morehouse & Wells Co. . . . . Decatur  
Cummings & Emerson . . . . . Peoria  
Weyburn Co. . . . . Rockford  
Velde, Roelofs & Co. . . . . Pekin

### INDIANA

Mossman, Yarnelle & Co. . . . . Fort Wayne  
Orr Iron Co. . . . . Evansville

### IOWA

Burlington Mfg. and Jobbing Co. . . . . Burlington  
Robert Donahue Iron & Hdw. Co. . . . . Burlington  
Des Moines Iron Co. . . . . Des Moines  
Sioux City Iron Co. . . . . Sioux City  
Peter Lamp Iron Co. . . . . Davenport

### KANSAS

J. W. Crancer & Co. . . . . Leavenworth  
W. A. L. Thompson Hdw. Co. . . . . Topeka  
Shattuck-George Iron Co. . . . . Wichita  
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Faeth Iron Co. . . . . Kansas City  
Haysler Iron Co. . . . . Kansas City  
Richards & Conover Hdw. Co. . . . . Kansas City  
Burgess-Frazer Iron & Hdw. Co. . . . . St. Joseph  
Robison Heavy Hardware Co. . . . . St. Joseph  
Beck & Corbitt Iron Co. . . . . St. Louis  
Campbell Iron Co. . . . . St. Louis  
Paddock-Hawley Iron Co. . . . . St. Louis

### NEBRASKA

Lincoln Hardware Co. . . . . Lincoln  
Baum Iron Co. . . . . Omaha

### OKLAHOMA

Oklahoma City Hardware Co. . . . . Oklahoma City

### OHIO

Cray Bros. . . . . Cleveland

### PENNSYLVANIA

Lyle Bros. . . . . Pittsburg

### SOUTH CAROLINA

Columbia Supply Co. . . . . Columbia  
Cameron & Barkley Co. . . . . Charleston  
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Magill Hardware Co. . . . . Chattanooga  
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Wm. Henry & R. E. Bell Hdw. Co. . . . . Ft. Worth  
Jos. F. Myers Co. . . . . Houston  
Bond Hardware Co. . . . . San Antonio  
Tips Hardware Co. . . . . San Antonio  
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### WASHINGTON

Seattle Hardware Co. . . . . Seattle  
Schwabacher Hardware Co. . . . . Seattle

### CUBA

Knight & Wall Co. . . . . Havana

### SAMPLE SET, ONE DOLLAR.

If your Jobber is not at this time handling **WELDARINE**, send us \$1.00 for a sample set of **WELDARINE** that will do from \$10 to \$15 worth of work, or \$4.00 for full working set. Sent charges prepaid, to any address.

Satisfaction guaranteed or money refunded.

Kindly give us name of your Jobber, and we will arrange for him to supply your future needs.

## THE WELDARINE MANUFACTURING COMPANY,

(Incorporated)

111 E. Seventh St., TOPEKA, KANSAS, U. S. A.

Cable Address, "WELDARINE," Western Union Code.

### WHAT THEY SAY

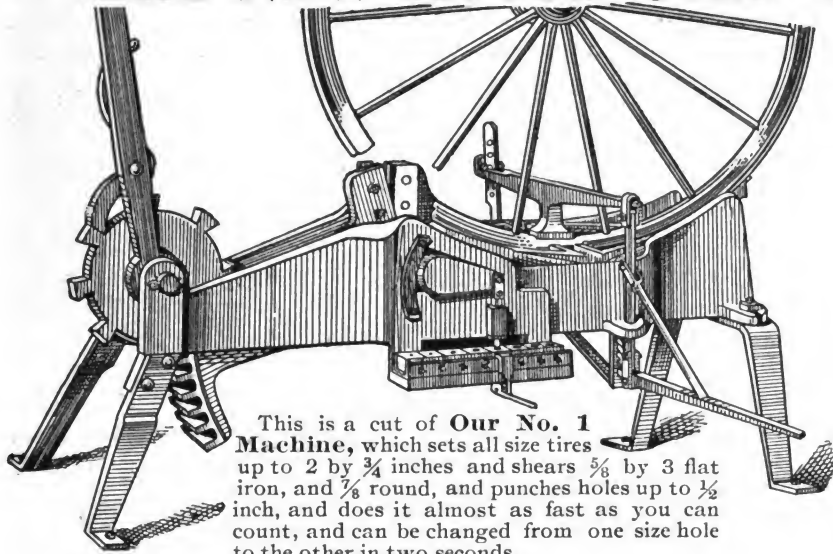
Tacoma, Wash.  
I have given your "**Weldarine**" a thorough test and find it to be just what you claim it to be.  
**BAILEY REPAIR CO.**

Wilson, Kans.  
I have used "**Weldarine**" on jobs 25c. up to \$15, and all have given entire satisfaction. It is a money-maker, and I will always keep it on hand.  
**J. W. ZAVODNIK.**

Topeka, Kans.  
Our foreman says that "**Weldarine**" is the only compound on the market that will braze cast-iron successfully. We have a great deal of this work to do, and with the aid of **Weldarine** have doubled our repair business.  
**EAGLE-MERCER ELECTRIC CO.,**  
**J. A. Mercer, Supt.**

One set of **WELDARINE** will do from \$50 to \$75 worth of work. Costs you \$4.00 per set. Put up in four packages and quick kleaner in a neat wooden box.

# THE NEW HOUSE COLD TIRE SETTER.



This is a cut of Our No. 1 Machine, which sets all size tires up to 2 by  $\frac{3}{4}$  inches and shears  $\frac{5}{8}$  by 3 flat iron, and  $\frac{7}{8}$  round, and punches holes up to  $\frac{1}{2}$  inch, and does it almost as fast as you can count, and can be changed from one size hole to the other in two seconds.

By using tire setter frame for shear and punch we produce same with little additional cost, and can make each customer

**a present of a  
Shear and Punch worth  
at least \$80.00.**

Our No. 2 Machine has both hand and power attachments and easily sets all ordinary tires up to 1 by  $4\frac{1}{2}$  inches, and shears  $1\frac{1}{4}$  by 5 flat iron,  $1\frac{3}{4}$  round, and cuts off axles up to  $1\frac{1}{2}$  square and will punch all size holes up to  $\frac{3}{4}$ .

Thousands of these Machines in successful use and on the market just four years. They have stood the test. Not one has been abandoned or broken up. We will be pleased to furnish you with the names of customers who have cleared \$2,000 per year on them, and names of those who have made single-handed \$60.00 in a single day. It costs nothing to keep in repair and will never wear out, and all you take in on it is clear profit.

Write us for catalogue and prices.

## HOUSE COLD TIRE SETTER CO.,

Office and Factory, 216-220 So. Third Street,

St. Louis, Mo.

## OUR ROTARY DRILL

*Has no  
Sprocket  
Wheels,  
Belts, Chains,  
or Springs.*

*No Separate  
Horse Power  
nor  
Tumbling Rods.*



## THE POWER IS DIRECT TO THE MACHINE

It is easy work for one man and one team to drill to the depth of 400 feet. One man and one team can set it up and begin drilling in 10 minutes.

Drill turns its own rope and drill bit never strikes twice in the same place, as drill bar revolves automatically. Will cut from hardest granite to dirt, and excels in quick sand. We carry drill supplies in stock. WRITE FOR PRICES.

**Fort Smith Well Drill Mfg. Co.,  
FORT SMITH, ARK.**

A Good Set of  
Bit Brace Nut  
Wrenches is al-  
most a necessity.  
A postal sent to  
us will bring net  
delivered price.



Do you want a  
Screw Plate cut-  
ting  $\frac{1}{4}$  to  $\frac{3}{4}$ ?  
Now is a good  
time to buy. Send  
for price deliver-  
ed to nearest R.  
Station.  
CATALOG  
FREE

## DON'T BUY A SCREW PLATE

—Until you know what the "REECE" IMPROVED SCREW PLATES cost and have heard our arguments in their favor. It Pays to look around before you buy and find out all you can about the different makes. You will find that the "REECE" SCREW PLATES have more points of **REAL MERIT** than any other kind. You will find that you always get about what you pay for. Low prices mean cheap goods. Our prices are not excessive and when you get a "REECE" SCREW PLATE you get one that will cost only a trifle more than a cheap screw plate and outwear two of them. Quality counts every time.

SOLE MANUFACTURERS  
**THE E. F. REECE CO.,**  
GREENFIELD, MASS., U. S. A.

**MR. SHOP OWNER:**

This is the hammer you should have on hand as a part of your shop equipment, because she is good at any season of the year,

**KERRIHARD POWER HAMMER**

**BUILT RIGHT. RUNS RIGHT. IS RIGHT.**

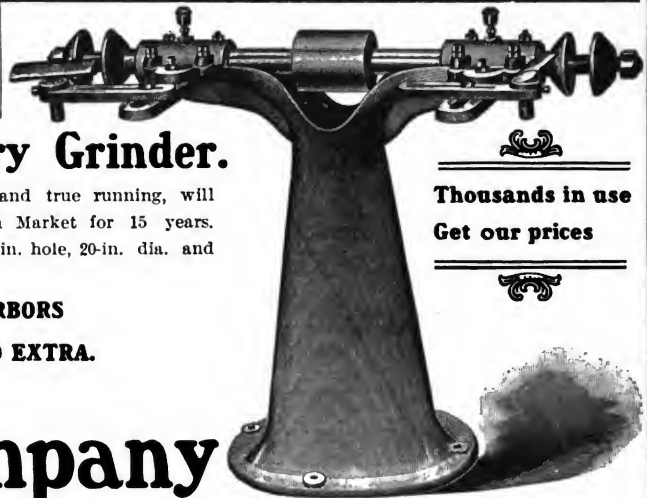
Designed for the blacksmith shop and built to stand the work. Made after correct lines and embodies correct mechanical principles.

**GET  
CIRCULARS  
AND  
PRICES.**

**1905 Emery Grinder.**

Built for shop work, easy and true running, will last a life time. Been on Market for 15 years. Will take Wheels with  $1\frac{1}{4}$ -in. hole, 20-in. dia. and 3 in. thick.

**SPECIAL ARBORS  
CAN BE  
FURNISHED EXTRA.**



**Thousands in use  
Get our prices**

**The Kerrihard Company**

**GENERAL FOUNDERS, RED OAK, IA., U. S. A.**

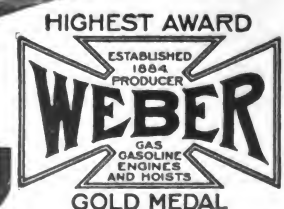
**THE ENGINE YOU WANT**

**Crank Shafts, Forged Steel,  
Connecting Rod, Steel Billet,  
Heavy Fly Wheels,  
Heavy Piston,  
All Parts well  
Made by High  
Grade Me-  
chanics.**

**All this means  
less cost to run  
than any other  
engine, for there  
will be less Fuel  
used.**

**Write us for  
Catalogue.**

**WEBER GAS and GASOLINE ENGINE CO.,  
Box V 1114, KANSAS CITY, MO.**





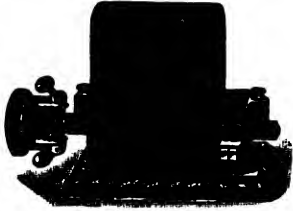
# PORTER'S THE BEST BOLT CLIPPERS

H. K. PORTER, Sole Manufacturer  
EVERETT, MASS.



This Cut Shows No. 2  
NEW EASY for 1-2-inch Bolts  
My Latest Tool.

"New Easy" for 5-16, 3-8, 1-2 and 5-8-inch Bolts



## HENRICKS MAGNETO

*Fires your gas or gasoline engine without the aid of batteries.*  
It is better and more durable than any Dynamo. Its Governor regulates the speed regardless of speed of Fly Wheel. Its Governor adjusts to Imperfect Fly Wheels. Its Governor insures a constant and uniform spark. The spark does not burn the contacts of the engine. All strains are removed from the bearings of Magneto. FULLY GUARANTEED. AGENTS WANTED.

## HENRICKS NOVELTY CO.

130 S. Capital Avenue

INDIANAPOLIS, IND.

**TRIMMINGS FOR EVERYTHING ON WHEELS**

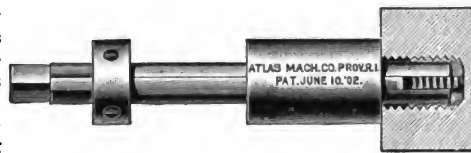
Wholesale Manufacturers  
Export Work our Specialty  
INDIANA TOP & VEHICLE CO.,  
LAWRENCESBURG, Indiana, U. S. A.

Write For Catalogue and Prices.  
TOUSHNETS, 110 1/2  
Lawrenceburg, Indiana, U. S. A.

## ATLAS EXTRACTOR OF BROKEN TAPS

A strong and simple device for removing taps broken off in a tapped hole. Works quickly and easily and will not injure the work. A time and money saver; always ready for instant use.

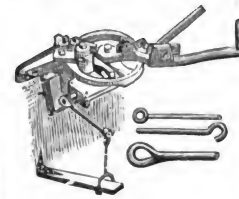
These tools are made in sizes of one-sixteenth from 1/8 in. up to and including 3/4 in., and in one-eighths from 3/4 in. to 1 1/4 in. inclusive, for three and four groove taps.



Write for circulars and price list.

Also makers of the ATLAS SWIVEL VISE and  
ATLAS TOOL MAKER'S VISE.

ATLAS MACHINE COMPANY, PROVIDENCE, R. I.



## EYE BENDERS.

We make hand power benders for forming eyes from stock 1 3/4 inch thick and under. Any size eye 7 inches outside diameter and under.

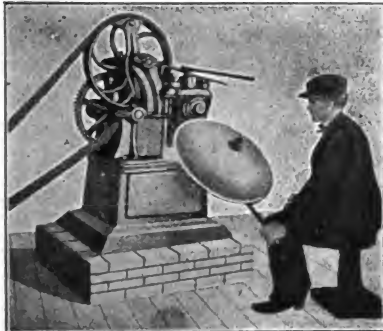
WALLACE SUPPLY CO.,  
316 Garden City Block,  
CHICAGO, ILL.

## NATIONAL BRAZING COMPOUNDS

for brazing cast iron, steel and aluminum. Greatest success of the age. Gold Medal awarded at Portland Fair. Eastern agents

DRISCOLL & FLETCHER,  
BUFFALO, N. Y.

Send for Circulars. Call and see a demonstration.



## SKOW'S ROTARY DISC SHARPENER

The most practical and economical machine on the market. Will roll any size discs. Guaranteed to excel all others.  
"You may make my regards for the machine as high as you want and I will vouch for them."

W. S. WILSON, Fowler, Kas.

I have tested your Disc Sharpeners thoroughly and find it is a money maker for me. I sharpen 16-inch discs in about five minutes and it does the best kind of work.

Yours truly,

ROBERT FISCHER.

Sent on trial to responsible parties.  
Catalogue FREE for the asking.

SKOW BROS., Newton, Iowa

## BEALS & CO. Iron, Steel and Hardware

Tools and Supplies for Horseshoers  
and General Blacksmiths  
Carriage Hardware and Woodwork

44, 46, 48 & 50 TERRACE, BUFFALO, N. Y.

## START THE NEW YEAR RIGHT

AND PLACE YOUR ORDERS FOR

## United States Shoes

"THEY ARE IN A CLASS BY THEMSELVES"

*Made in All Sizes and Patterns*

And the BEST SHOES on the Market.

For Sale by All Leading Jobbers.

Write for Catalogue.

United States Horse Shoe Co.

Rolling Mills and Factory, ERIE, PENN.





## An Indication of Satisfactory Service

Is the ENORMOUS AMOUNT of BUSINESS  
placed with

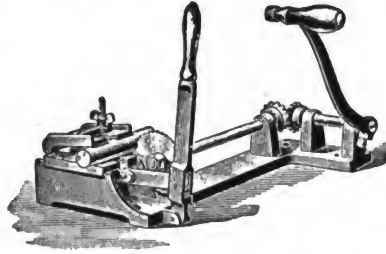
# KELLEY, MAUS & CO.,

CHICAGO, ILLINOIS,

DURING THE YEAR 1905.

It is also an Undeniable Evidence of PROMPTNESS in FILLING ORDERS  
AT THE RIGHT PRICES.

Our Latest Bargain Sheet  
JUST OUT  
Presents a Large  
Assortment  
OF MATERIALS.



A METAL CUTTING SAW  
FREE

With each Order selected  
from Bargain Sheets  
amounting to \$25.00  
or more.

Send your orders for WAGON and CARRIAGE MAKERS' MATERIALS, BLACK-  
SMITHS' and HORSESHOERS' TOOLS and SUPPLIES to

# KELLEY, MAUS & CO.,

LAKE STREET BRIDGE,

CHICAGO,

ILLINOIS.

Mention this Paper.



# DRYDEN'S HIGH GRADE HOOF PADS

MADE OF NEW RUBBER.



Leather Back  
Black Rubber  
Medium and Heavy  
*Ask Your Dealer  
for Them.*



We make Eighteen  
Different Styles.

Send for Booklet



# Dryden Hoof Pad Co., Chicago, Ill.



**MAYERS**  
**Cold Tire**  
**SETTER.**

ALL STEEL, WARRANTED.  
WEIGHT 700 LBS.

Henry Mayers Machinery Co.  
1721-23 North 8th Street,  
ST. LOUIS, MO.

Patented Sept. 12, 1905

The only Cold Tire Setter made in which both heads come together at same time and Grip KEYS SET THEMSELVES.

Our Catalogue gives 5 views of the working parts. We have no "secrets" about it and they make it so plain its like having the machine before you.

**WILL YOU LOOK?**



A low wagon at a low price. Handy for the farmer. Will carry a load anywhere a horse can travel.

**Low Down Wagons**  
soon earn their cost on any farm.

**Steel Wheels**

for farm wagons. Straight or staggered spokes. Any size wanted, any width of tire. Hubs to fit any axle. For catalogue and prices, write to Empire Mfg. Co., Box 95 H Quincy, Ill.

**THE "GEM"**  
INVESTIGATE ITS MERITS.

Get Prices from your Supply House.

**For Sale by All Jobbers.**



**THE "GEM"**  
IT WILL PAY YOU.

**CONSOLIDATED**  
**HOOF PAD CO.**

18 Vesey St. NEW YORK.

**Modern Power Hammer**

The ONLY hammer on which you can get a LIGHT BLOW at FULL SPEED.

The shifting lever controls the length of stroke.

Set it in any one of the five notches and then handle the hammer with the treadle the same as any other.

Actually five hammers in one.

Write any jobber or the

**THE GRINNELL MFG. CO.,**  
GRINNELL, IOWA.



**PASS**

International Correspondence Schools  
Box 1302, Scranton, Pa.

Send free your booklet "1001 Stories of Success," and pass the undersigned to a full explanation of how he (or she) can qualify for a larger salary in the position before which is marked X.

Foreman Molder	Electrician
Foreman Blacksmith	Architect
Foreman Machinist	Structural Engineer
Foreman Toolmaker	Contractor & Builder
Foreman Pat'nm'r	Foreman Plumber
Mechanical Engineer	Civil Engineer
Machine Designer	Surveyor
Mechanical Draft	Mining Engineer
Stationary Engineer	Bookkeeper
Electrical Engineer	Stenographer
Elec. Lighting Supl.	U. S. Civ. Ser. Exam.
Elec. Railway Supl.	Ad. Writer

Name \_\_\_\_\_

St. and No. \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

**The Pass to a Larger Salary**

Have you ever stopped to consider what the above coupon is worth to you? Have you ever reasoned that it is the offer of the Largest Educational Institution in the World that has had 14 years' experience in qualifying tens of thousands of people for better positions and increased earnings, to help YOU obtain a better position and a larger salary?

A coupon like the above has proved the pass to a larger salary, a better position, and increased happiness and prosperity to over 100,000 people, who are living proofs that we can do all we say. If you so wish, we can give you their names and addresses and you can ascertain from them the truth of our statements.

If YOU really want to better yourself, the I. C. S. can and will help you, no matter how poor your circumstances are; no matter how young or how old you are; how scant your education may be. No time lost from your present work. No books to buy. Pay on terms you can afford. If you realize the worth of this coupon, mark it and mail it to the Schools. It puts you under no obligation to do this. It is simply a free way to find out how to make a success of your life.

**USE YOUR PASS NOW**

## WOLFE'S COLD TIRE SETTER.

A MONEY MAKER FOR THE BLACKSMITH.

THE BEST MACHINE ON THE MARKET  
FOR SETTING AND RE-SETTING TIRES  
COLD.

The desirable points in a cold tire setter are strength, endurance, quick adjustments and economy of space. Wolfe's Cold Tire Setter combines these to a remarkable degree. It occupies 2 ft. x 3 ft. floor space. It is made entirely of best open-hearth steel; it is neat in appearance, and will last a life-time.

GIVES SATISFACTION TO EVERY  
PURCHASER.

Edward Black, Bendersville, Pa.—"The Wolfe Cold Tire Setter bought of you is the machine to set tires quick and right. Does better work than any other machine I know of, and beats the old way of setting tires, three to one. It is just what every blacksmith needs."

INCREASE YOUR TRADE.

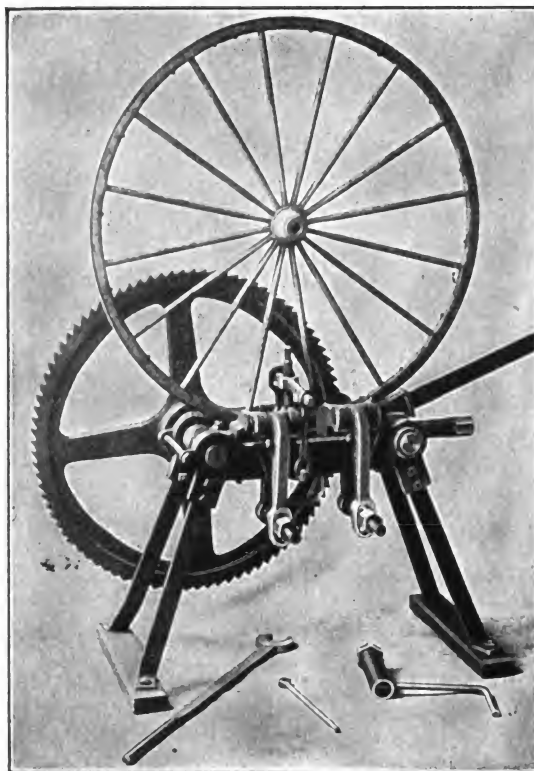
By buying one of these Up-to-date Modern Machines. It means quick, efficient service to your customers. You can set their tires "while they wait." Saves time, labor, means more trade and more money for the smith.

Interesting descriptive circulars SENT FREE.

Write today—a postal will do.

MANUFACTURED BY

THE G. M. YOST COMPANY,  
WAYNESBORO, PA.



## BOSS LEATHER APRONS

Made of Cow Hide, Purely Bark Tanned.  
Soft, Pliable and Unequalled for Strength.

They Outwear Six  
Of the Ordinary Kind

Ask Your Jobber for  
The Boss Leather Apron.

Have you Tried Them?  
Strongest, Most Durable.



If he cannot supply you send your order direct to us. Upon receipt of price we will ship a perfect "BOSS" Apron to you, charges prepaid, or will send same by Express, C. O. D., giving you the privilege of examining it at the Express Office, and if does not meet every requirement, send it back at our expense.

The "Boss" Aprons come complete either with or without bib. They have brass eyelets and leather straps and every possible convenience.

### PRICES.

"THE BOSS,"  
Size X, 30x36 in. .... \$1.50  
" A, 26x33 in. .... 1.25  
" B, 24x30 in. .... 1.10  
" C, 24x27 in. .... .85

"THE BOSS" with Bib.  
Size D, 30x42 in. .... \$1.75  
" E, 28x38 in. .... 1.50  
" F, 26x34 in. .... 1.25

Write us today and we will send you a miniature Apron free, showing the material used and how they are made.

**Edmund C. Beckmann,**

Sole Manufacturer,

712 N. Fourth St., St. Louis, Mo.







## The Reason Why MORGAN & WRIGHT HOOF PADS

Have made such a decided hit with wide-awake blacksmiths is due ALMOST WHOLLY to this fact:

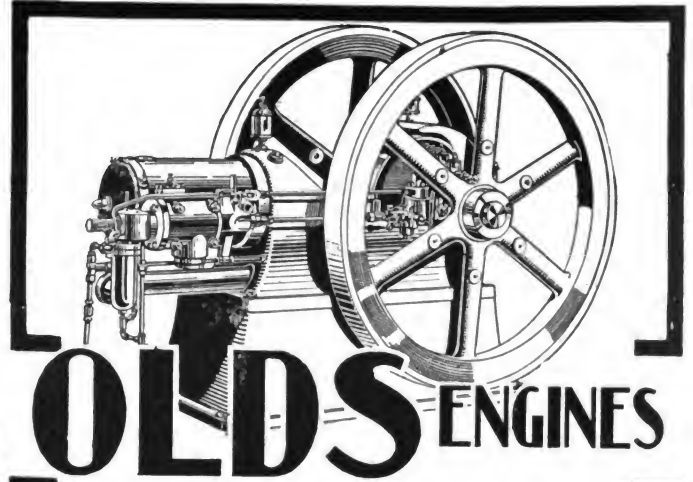
They have educated hundreds of horse-owners to the pad-using idea by PROVING to them that GOOD pads are a BIG HELP in keeping a horse in workable condition. And by giving the owner MORE SERVICE FOR HIS MONEY than he has been in the habit of getting from other brands, the smith has been able to get a BIG HOLD upon the pad business of his community.

This is not idle talk. Ask any smith who makes a SPECIALTY of M. & W. Pads WHY he finds it profitable to do so.

**A Pad for Every Purpose--15 in all.**

Every Pad a friend-maker for the Blacksmith.  
Ask your Jobber.

**MORGAN & WRIGHT  
Chicago.**



There is no gas engine as simple as an Olds--compare it with others and this statement is proved. The repairs cost practically nothing. Every adjustment is very simple to make.

Exact duplicates of any part can be furnished at once, perfectly machined and ready to put on. This is important in case of accident.

### The Most Economical Engine

For power in blacksmith shops, etc. Our reference--the User--the Man with an Olds.

The reason why is interestingly told in our catalogue mailed on request. Tell us your requirements and we will help you figure out what you need. Send for our catalogue showing Type A (2-8 h.p.), Type G (8-50 h. p.), Type K and N (12-1200 h. p.) used with our Gas Producer, it will reduce fuel cost 75 per cent.

### Celebrated Picture Free

For 4c. in stamps to pay cost of mailing, we will also send you Rosa Bonheur's "Horse Fair," the most celebrated animal picture in the world, size 16x20 beautifully colored, suitable for framing.

### OLDS GAS POWER CO.

975 Chestnut St.

Lansing, Mich.



## Fact not Theory

Is what you are after. You want to know how to work steel at your forge. You desire the practical knowledge that will enable you to judge, forge, temper, weld, anneal and harden this most particular of metals. You want Sound, Solid, Steel talk, and you get it in

## The Scientific Steel Worker

By O. A. WESTOVER

A book written by a blacksmith and expert steel worker, and containing new methods of working steel, directions for manipulating the new steels; how to forge, harden and temper all kinds of tools; instructions for case hardening, annealing, welding and brazing. It contains recipes for welding and hardening compounds, twenty-four pages of mechanical tables for calculating iron, steel and angle iron, and many miscellaneous pointers contained in no other work.

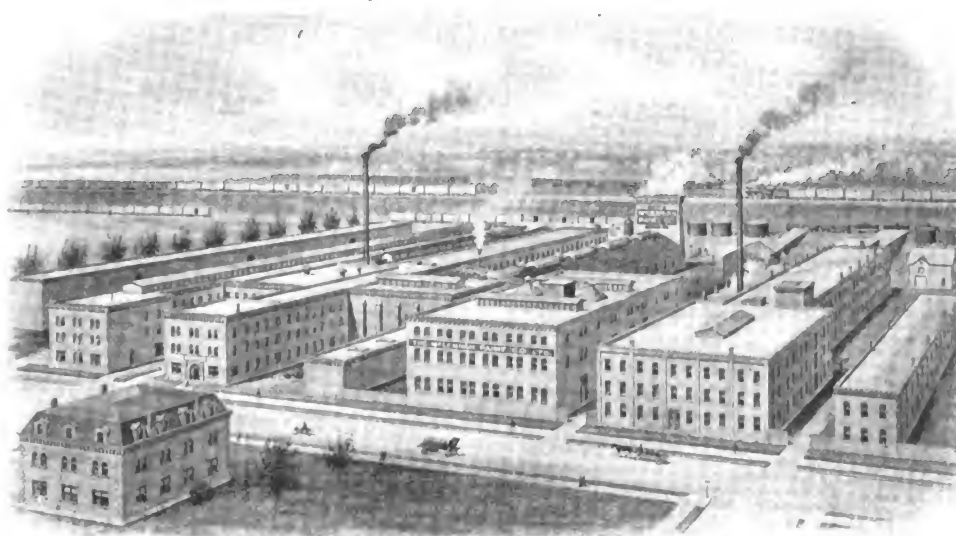
The book is not written in "flowery" language, but is "meat" from cover to cover, and is easily understood. Exceptionally well bound in blue and red, and sent post-paid upon receipt of \$1.50. Address all orders to

**The American Blacksmith Co.**

P. O. Box 974.

BUFFALO, N. Y.

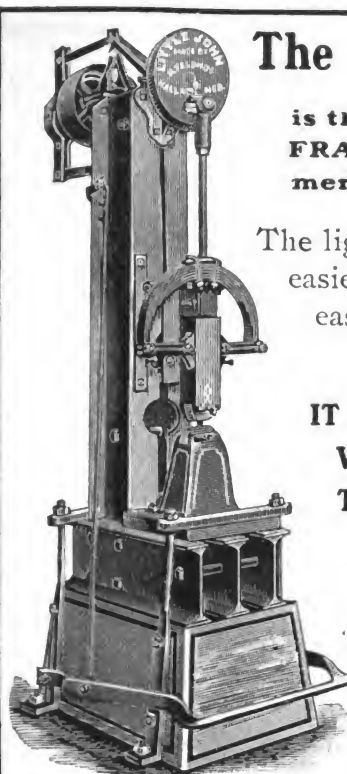
AGRICULTURE, IMPLEMENT  
AND WAGON  
**PAINTS AND VARNISHES**



**THE MCLENNAN PAINT CO.,**  
**BUFFALO, - N. Y.**

Write us for prices on our

Buffalo Wagon Reds - Yellows - Greens  
Oil Dryers - Reducers - Japans - Varnishes  
Dry Colors - Enamels  
Steel and Iron Paints and Specialties.



## The "Little John"

is the only **STEEL FRAME** power hammer on the Market,

The lightest, most durable, easiest controlled and easiest running hammer made.

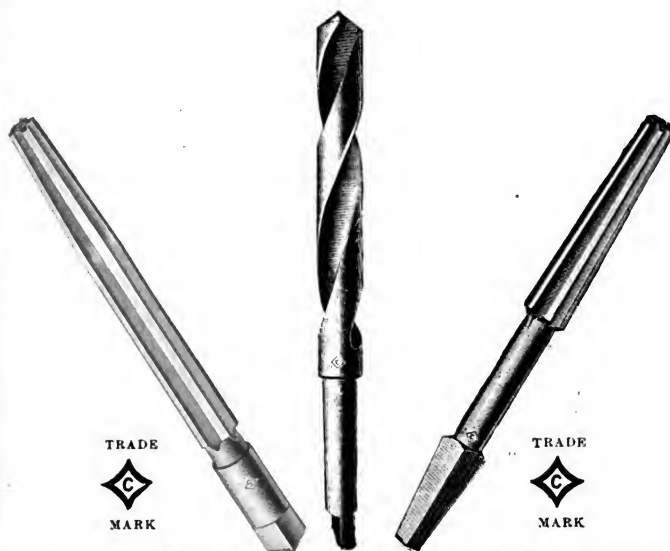
**IT WILL DO A GREATER VARIETY OF WORK THAN ANY OTHER HAMMER.**

"I have operated four hammers, the Minneapolis, Hawkeye, The Little Giant, and yours, and I think that yours runs the best of them all."

ANDREW SCHAUPPNER  
Belden, Nebr.

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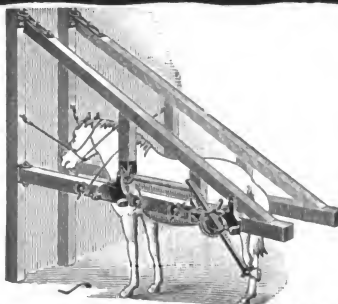
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HOLGINS & DOUGLASS.

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Has a record of five toes per minute, and this machine installed in your shop will save you in cash at the rate of \$6 per day when in use.

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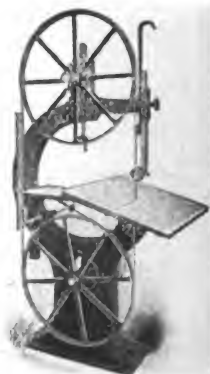
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THE SIDNEY TOOL CO.,

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## 1906 PATTERNS

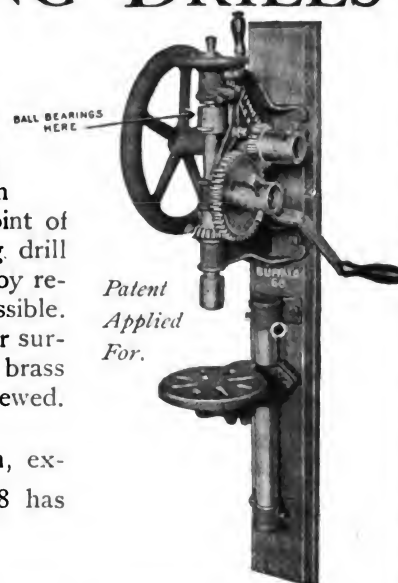


Patent  
Applied  
For.

Buffalo No. 66 Ball  
Bearing Drill.

OUR new Buffalo Nos. 66 and 68 are Ball Bearing Hand Drills of surprising strength and capacity. Suitable for the average Blacksmith Shop. The Ball Bearings are placed at the point of greatest friction, where the rapidly revolving drill spindle is connected to the feed screw, thereby reducing wear to the greatest minimum possible. Operate with greatest ease and will do work far surpassing any other hand drill on the market. No brass connection nuts or soft metal bearings to be renewed.

Both these drills are identical in construction, except that No. 66 has an iron back, and No. 68 has a wood back.



Patent  
Applied  
For.

Buffalo No. 68 Ball  
Bearing Drill.

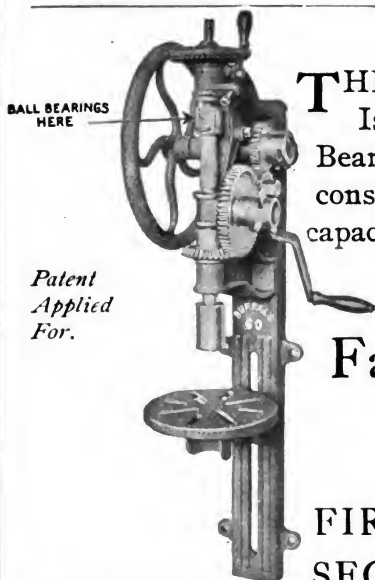
This is an enlarged sectional view of Ball Bearing Connection, with Ball Case, Disconnecting Key and Bearings. Used exclusively on our Nos. 60, 66 and 68 Drills.



HERE is the Point of Greatest Wear.

HERE is the Greatest Difference in Speed.

HERE are the Ball Bearings.



Patent  
Applied  
For.

Buffalo No. 60 Ball  
Bearing Drill.

THIS is our new BUFFALO No. 60 Hand Drill.

Is equipped with the same excellent Ball Bearing connection as our Nos. 66 and 68, but is considerably larger, and has a much greater capacity. Intended for heavy blacksmithing.



BALL BEARINGS  
NOT HERE  
BUT HERE  
BALL BEARINGS

## Famous Buffalo No. 90 Drill

Lever Feed with Three  
Distinct Features.

**FIRST** It is made from a single piece of Heavy Forged Steel. No fittings, light castings or projecting parts to be bent or broken. Patent Applied For.

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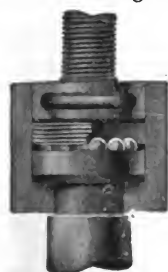
This cut shows the enlarged end of feed screw with ball case, disconnecting key and bearings used exclusively on the Buffalo No. 90 Drill.

Send for Catalogue showing our extensive line.

Buffalo No. 90  
Ball Bearing Drill.

Buffalo Forge Co., Buffalo, N. Y., U. S. A.

Canadian Buffalo Forge Co., Ltd., Montreal.



## Walking on Velvet.

That's what horses do  
when they wear our

## HOOF PADS

They make travel more comfortable for "man's best friend" and greatly lengthen his life of usefulness.

We know our PADS are good, because they have been submitted to the best authorities and pronounced correct in design.

We know their construction is perfect—the quality of rubber just right to secure the best possible results.

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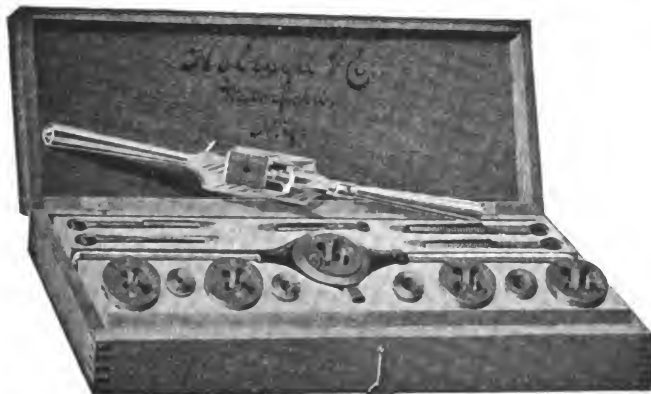
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## "LITTLE DAVID" SCREW CUTTING TOOLS FULLY GUARANTEED.



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our new line. Write today.

Descriptive Circulars and Price List Ready for you. They  
are Free—shall we send them?

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**CONANT & DONELSON CO.,**  
GREENFIELD, MASS.

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## The Snow King

Leather Back, Cushion or  
Suction Cup. Built like a  
fly's foot. Keeps horse  
from slipping on asphalt  
or icy pavements.

## THE NIAGARA

White Rubber  
Exposed  
Leather Back.

## THE EASY

Extra Heavy Leather  
Back Has the rubber  
where it is needed

Prevent strains, corns,  
and other foot troubles.

**THE GOODYEAR TIRE & RUBBER CO., AKRON, OHIO.**

Branches at Boston, Chicago, Denver, New York, San Francisco and Los Angeles.

# THE AMERICAN BLACKSMITH

A Practical Journal of Blacksmithing and Wagonmaking

VOLUME 5

MARCH, 1906

NUMBER 6

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Duly entered as second-class mail matter, at Buffalo, N. Y. Act of Congress, March 3, 1879.

## When Asking Questions.

When seeking information through our columns, tell all you can regarding the matter in question. State your case fully. It is very often necessary to guess at the questioner's meaning, and of course, in cases of this kind it is often doubtful whether or not the reply tells what is wanted. A question fully explained is half answered and our readers who desire information can assist us greatly by bearing this in mind.

When you desire answers by mail enclose a stamp for reply. Not only does this refer to questions asked of the editors, but of the contributors as well. One of our contributors has just written to say that he did not pretend to answer letters sent him with no stamps for reply.

## The Prize-Puzzle Picture Contest.

The prize-puzzle picture, which appeared in the January issue, brought in many very clever replies, and the awarding of the prizes was in consequence very difficult. The answer and statement which in our judgment is entitled to the first prize of five dollars was sent in by Mr. George H. Watkins of Kansas. The other prizes of one year's

subscription each to The American Blacksmith were awarded to Mr. S. P. Hartzler, Ohio; Mr. W. M. Spence, South Carolina, and Mr. H. F. Dissinger of New York State.

Of course, the shop belongs to our old friend Tom Tardy, and at the time the picture was taken Tom was warming his shins at a nearby business place where there was a good roaring fire. The sign over the door is that of the former occupant and Tom "ain't had time yet" to change it for his own.

## A Mighty Good Investment.

When you hear of a company or corporation offering an abnormally high rate of interest on your investment, you usually give them a wide berth. Hence if we told you that an investment of one dollar had been returned to a smith a thousand fold, we doubt very much that you would take it for fact. Yet that is exactly what THE AMERICAN BLACKSMITH has done for a certain progressive South Carolina Smith. He writes as follows: "A few years ago your paper was handed me by a fine up-to-date master mechanic who knew I could not do his work without the aid of a first-class blacksmith paper. I subscribed for THE AMERICAN BLACKSMITH. Was then receiving \$1.75 per day of 10 hours. I am now offered \$5.00 per day of 8 hours. This I consider was accomplished by reading THE AMERICAN BLACKSMITH and paying strict attention to the instructions contained therein and of the master mechanic named above. I like the forging instructions best, but could not get along without anything that it contains. The more subscribers I can get for THE AMERICAN BLACKSMITH the more valuable to me it will be." Doesn't it follow, that the dollar paid for a year's subscription is a mighty good investment? Doesn't it occur to you that your brother smith will be interested in such a paper? Approach him with a subscription blank and secure his order. Of course, we expect you to help us on toward the 40,000 mark. We want to reach it and you want us to reach it, so don't delay,

but send in your new subscriber *now*. If you have a chance later, to get another, so much the better, but don't fail to send in the one we expect of you.

Benefit yourself by being of benefit to others. Call your neighbor smith's attention to THE AMERICAN BLACKSMITH and acquaint him with the advantages of taking it. If you want any assistance in securing subscribers drop us a postal and by return mail will come sample copies, testimonials, blanks and other literature prepared for just this purpose. Do you want a larger, better and more valuable AMERICAN BLACKSMITH? Then put your shoulder to the wheel.

## The Good Road Movement and the Blacksmith.

Do you realize, Mr. Craftsman, what the Brownlow good roads' bill means to you? Are you giving it your support or are you talking against it? It's a mistake to suppose that the passage of this bill will effect the farmer only. The good roads' movement directly involves the general welfare of the country and is of no little consequence and concern to "butcher, baker and candle-stick maker." And the smithing craft, with its allied trades, is not the least effected of the industries. Good roads will encourage travel both by horse and horseless vehicles and the more travel, the more work for the smith. The effect of better highways on the farmer will also indirectly effect the smith, in that the farmer finding a steadier market for his products, by reason of the uniform condition of the roads, will be better able to meet his obligations to the man who keeps his implements in condition. Better roads will, without a doubt, increase automobile travel in some localities to such an extent as to necessitate the establishing of repair stations on the principal roads, and the smith who does not take advantage of this opportunity for added profit may be accused of lacking progressiveness. Already have many of our readers added an automobile department and those smiths not yet acquainted with automobile construction and repair will do well to devote

some time to studying this class of vehicle.

There are many other sides to this movement, local and national. But the craft cannot help but see that the national good roads' question effects them very materially and the smith who gives the matter careful consideration, looks on every side of it, views the matter broadly, will become a strong supporter of the bill and give it his active support.\*

The road question is of vital concern to the smith and every other craft and the sooner it receives the attention of Congress the better for the country.

#### Candlesticks of Wrought Iron.

The engravings of wrought iron work shown this month are of two very artistic wrought-iron candlesticks. These pieces are exceptionally well executed and show much originality. The tulip design is especially handsome and shows none of that stiffness usually found in floral work. It is very evident that the maker is either very well acquainted with the living tulip or modeled his piece directly from the flower.

Mr. J. M. Drew, to whom we are indebted for this artistic work, sends it "as a suggestion for those who do fancy work on the side." And the craftsman, looking for a side line and having some artistic ability, will do well to make up two or three pieces and "try them on his customers." In this way and without great expense he may ascertain whether or not his locality is suited for this work.

#### Painting a Surry.

Processes Observed and Colors Most Popular.

M. C. HILLOCK.

Today among country folk and village carriage users, the surry in its various styles is regarded as an indispensable family carriage, which fact makes the painting and finishing of it of especial importance to village and country painters. The greater share, by far of painting done upon this class of carriages comes under the head of repainting and so in this article we will devote attention chiefly to this department of work, and to cover the subject completely, and to make the suggestions offered, applicable to both old and new work, we will describe our method of painting a burned off surry—that is, a surry from which the paint is burned off the body. Running parts are seldom in such a condition that they cannot be surfaced upon the old paint and made to look more than passable. In former issues of THE AMERICAN BLACKSMITH the process of burning off paint has been rather minutely de-

scribed, and it therefore, remains only here to say that a good, strong burning lamp, such as has from time to time been made known in the advertising columns of this paper, is needed both as a matter of safety and as a means of getting good results.

The actual work of burning is simple enough. Heat the paint until it becomes soft and remove it from the wood with a broad blade putty or scraping knife, being careful not to gouge or disfigure the wood, nor to burn it. The latter accident being, if anything, worse than the former, because the wood once burned and charred is quite beyond the power of anyone to restore it to its normal condition. And to make paint stay in place over a surface once charred and rendered negative by the



A NEAT DESIGN IN WROUGHT-IRON.

heat is very difficult, if, indeed, not quite impossible. There are other points about the burning off process, but the above are the supremely important ones, and the ones not mentioned will be learned as you progress in this line of work.

Having burned the paint from the body, this particular part of the vehicle bears a very close relationship to the new surface of the new vehicle. Sandpaper carefully, and if a scorched patch of surface is found, scrape it down, and sandpaper until the old dead fibre of the wood is removed. Dust off and apply

a coat of lead and oil mixed with raw linseed oil and turpentine, equal parts, and a half gill of pale drying japan added to each quart of the mixed paint. Rub this lead hard into the wood with a bristle brush bound tight enough to give the brush a good measure of stiffness. Of course, if this surface were an entirely new one, a little larger proportion of oil would be in order. Sandpaper the old paint surface of the running parts, scraping any and all flaky or loose paint stretches with a scraping knife (an old mowing machine knife will answer the purpose capably) and otherwise making the paint surface remaining, smooth and solid. Dust off and touch up all the bare places with the same lead used upon the body. The felloes of the wheels are nearly always stripped of paint, and these parts should properly receive a special treatment. After smoothing down close and fine, apply a lead coat carrying, at least, 5 parts raw linseed oil and 3 parts turpentine. This will bind the paint a little harder upon a portion of the surface exposed to exceptionally severe service. Give the touched-up spots plenty of time to dry hard—48 hours, at any rate—and then over the entire surface apply a coat of lead mixed, 7 parts turpentine and 1 part raw linseed oil. Color the lead with lampblack for a dark color, and with Indian red for any of the reds now popular. Apply with a camel's hair brush, and lay on a smooth, uniform coat. Now set running parts aside, and the lead coat on the body having hardened sufficiently, proceed to putty all existing cavities and other defects with a hard drying putty, the composition of which has been described in former issues. Sandpaper with No. 2 paper, the inside of the body and apply a coat of the flat lead such as was used upon the running parts. Stand the body aside for 24 hours in a warm, dry room where the putty will dry hard. Then apply a coat of roughstuff made of equal parts, by weight, of any good American filler and white keg lead mixed to a very stiff paste—thick enough, for example, to hold upright a stick thrust into the centre of the mass—with equal parts of rubbing varnish and coach japan, the mass then being thinned to a brushing consistency with turpentine. A coat of this pigment may safely be applied every day.

Roughstuff should be carried to the surface a little heavier in body than ordinary paint. Lay the first coat off with horizontal strokes of the brush and the second coat with vertical strokes,



and *vice versa*, thus establishing a denser and more compact, and, possibly, a more uniform depth of material. Four coats of roughstuff, the last one colored either lighter or darker, in order to make it serve as a guide coat in rubbing, should suffice for all but concave surfaces which will require an extra coat of roughstuff, at least. It is a well known fact among carriage painters that the concave surface will exaggerate surface defects and "grain out" more fully, or appear so, than any other form of surface. Meanwhile, upon those parts of the body interior, which show plainest a couple of coats of the roughstuff should be applied. These may be quickly smoothed up with the rubbing stone at the time the outside of the body is rubbed, and the finish will then look more uniform, and in harmony. Before rubbing the roughstuff, mix up a little lampblack with some varnish "slops" and coat up both sides of the bottom of the body.

While the roughstuff is hardening to a condition to rub, proceed to sandpaper the running parts, having previously puttied any and all places needing it. Dust off, and if you are getting enough money to warrant it, use rub lead, rubbing it firmly over the surface either with the bare hand or with a common harvesting mitten. Otherwise, mix lead with turpentine, using only the oil in which the lead is ground for a binder, and apply this with a camels' hair brush, taking care to lay it very smoothly. The rub lead, in case this should be used, is made of dry white lead mixed by running through the paint mill in  $\frac{3}{4}$  raw linseed oil and  $\frac{1}{4}$  coach japan. For new work,  $\frac{3}{4}$  oil and  $\frac{1}{4}$  japan is generally used. Apply this lead a little heavier in body than ordinary lead, and when set rub it out.

Upon either the rub lead or the "dead lead" coat, sandpaper preparatory to putting on the color, or the ground work for the color, as the color chosen may suggest. Apply one coat of color, and then one coat of color and varnish, or a coat of glazing, if the color selected, invites it, and when this coat is dry, reduce the gloss by rubbing the surface over with a soft sponge dipped in water and No. 00 pulverized pumice stone. Wash up and apply the necessary striping after which, in due time, flow on a coat of clear rubbing varnish. Permit this to dry very firmly and solidly, after which rub with No. 00 pulverized pumice stone and water. Wash up thoroughly, clean up, and then finish with a fine, rich gear finishing varnish, flowing

on all the surface will carry. It is the deep, heavily flowed on coats of varnish, both rubbing and finishing, that furnish the finish that stands out and wins admirers and last of all, wears without bringing reproach upon the finisher.

Turning attention to the body, permit the roughstuff to harden so that in rubbing, the stone or rubbing brick does not "gum up" with the pigment. Do not rub with a circular motion of the stone, but rather, so far as possible, use the straight out and back stroke, using plenty of water and keeping the surface washed up in order to determine how the rubbing is progressing. If there are



A TULIP OF WROUGHT IRON.

mouldings to be rubbed, fit a small piece of stone over such parts, taking care not to strip them unnecessarily of pigment. For concave surfaces, shape the stone to a convex surface, thus fitting it to rub without tearing up or in any way injuring the work. For a cheaper job, omit rubbing the moldings, if any, with brick or stone, using instead a piece of No. 0 emery cloth, or if this is not procurable, use pieces of sandpaper. The bottom sills of the body should receive a couple of coats of roughstuff for a width of 2 inches all around, and this should for a first-class

job be scoured off with a coarse brick. Color this up with the rest of the body, and apply a coat of varnish, so that when the later coats of varnish are applied they may be rubbed and cleaned up more easily and thoroughly. The roughstuff having been rubbed, the body is next set aside until the following morning when with No. 00 sand paper it is given a sort of polishing-up treatment. Sand the inside of the body very carefully, using No.  $\frac{1}{2}$  paper. Then dust thoroughly, both inside and outside, and proceed to first apply a coat of color to the inside of the body. Then with a different cup and brush, apply color to the outside of the body. The seats, of course, have not been specifically mentioned, but they are included with the body and should receive the same treatment throughout. Apply two coats of the color, these to be followed with a coat of color and varnish, or, as it is often called, colored rubbing varnish. Rub in due time on this coat with No. 00 pumice stone, flour and water; using felt pads to rub with. Rub only lightly to knock off the nibs and remove the gloss. Next flow on a heavy coat of clear rubbing varnish, to which should be added a bit of the regular body color, to preserve the natural and original color of the surface. This coat will stand a good solid rubbing, in due season. Rub close up to all mouldings, medallions etc., and rub to a uniform depth. For a class of work that commands sufficient price, again apply a coat of clear rubbing varnish, which when perfectly hard, will not need a close rubbing. Always, however, rub uniformly, and, above everything else, wash up perfectly clean. Last of all, in a clean room, with a clean surface, and with conditions to match the extreme delicacy of the work, flow on all the finishing varnish the surface will carry—and it will carry an exceedingly heavy coat, if skillfully applied.

In reference to colors for painting surreys. Some of the finest carriages of this class are painted dark, elegant green panels with moldings black, the running parts being painted a lighter shade of the same green, and striped double lines of carmine or double lines of black, or with a  $\frac{1}{4}$  or  $\frac{1}{2}$ -inch line of black paralled on each side with a line of carmine. Ultramarine blue panels, dark, are also considerably used; the running parts to correspond, and often striped in double fine lines of gold bronze, or double  $\frac{1}{4}$ -inch lines of black. Again, a favorite style, and a fetching one, too, is to paint the panels maroon, deep, and

the moldings black, the running parts being painted lighter shade of maroon and striped with double fine lines of black. The greens, however, lead in



STEPHEN S. BAIRD, WHO DISCOVERED THE SECRET OF COPPER WELDING.

popularity and these consist of 20th. century green, olive, quaker, Brewster and bottle green, all in three shades, along with others hardly less beautiful.

#### A Preparative for Preserving Steel.

The following report on a preparation to prevent the formation of rust on steel will be of interest to our readers. It has been forwarded by Mr. R. Radclyffe Hall, B. A., the acting Island Professor of Chemistry at Barbados.

"I have for a long time been in want of a durable elastic (*i. e.* stretchable) and colourless coating for preserving steel articles from rust. I tried many preparations, solutions of resins, and so on, without getting what I wanted; but this material seems to be in all respects satisfactory. I have put it on a palette-knife blade and find I can bend the blade double without cracking the varnish; it is if anything improved by exposure to the heat of the water bath; it will stand soaking in water for two to three hours without change and only shows a slight whitening after several hours' immersion; it is almost colourless when coated on steel. It will not, of course, resist prolonged friction or the action of alcohol.

I send you the recipe in case you should care to publish it, as, no doubt, you have had applications for such a preservative. The following is the recipe:—

Gum mastic.....	2	parts	by	weight
Gum sandarach.....	3	"	"	"
Gum elemi.....	1	"	"	"
Camphor.....	1	"	"	"
Dissolved in about 20 parts by weight				

of strong alcohol. The alcohol should be of 90 per cent. strength or over; the resins or "gums" are shaken up in the alcohol until dissolved, which takes place before decanting: it, of course, evaporates very rapidly and must therefore be kept tightly corked.

I found that 2 oz. of "gum" mastic, 3 oz. of "gum" sandarach, 1 oz. of "gum" elemi, and 1 oz. of camphor, dissolved readily in a whiskey bottle full of alcohol such as can be obtained before dilution, and is then of satisfactory strength. Small articles to be coated all over are best dipped into the solution, drained and held in the air for a few moments while the alcohol evaporates; larger articles can be painted quickly and conveniently with a soft brush.

#### The Discovery of the Secret of Copper Welding.

Stephen S. Baird, a Vermont gunsmith, after some forty years of study and painstaking effort, claims to have discovered the secret of copper welding.

Mr. Baird says: "About 40 years ago I was first possessed of a desire to weld copper. I do not know myself why; but some unknown force seemed to impel me to do it. I talked with learned men about the matter whenever I had the chance, withholding the knowledge that I was working along that line. Various opinions were expressed; some thought that copper welding was a lost art; others that it had never been weld-

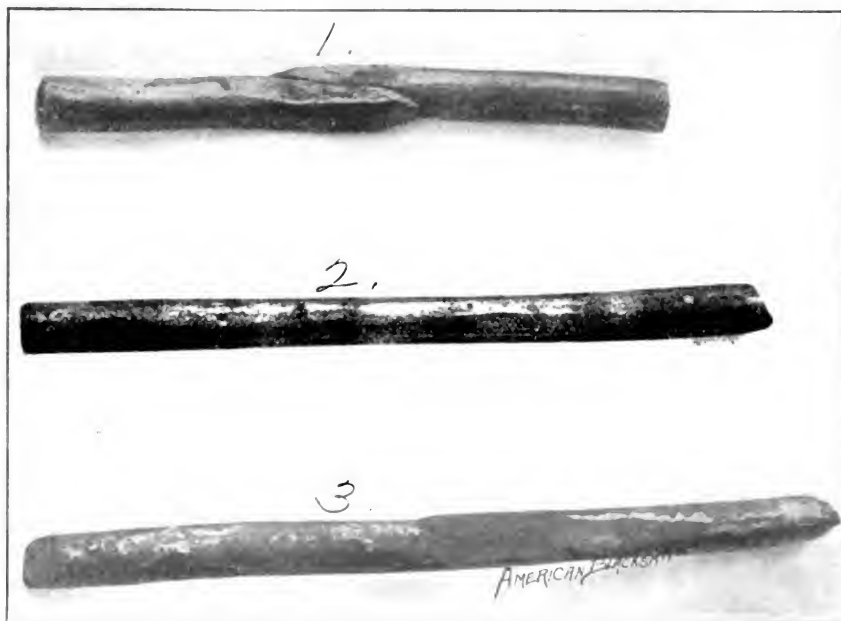
not discouraged by these opinions, however, and it has always been a pleasure while working in my shop at gunmaking to experiment with copper. Time after time different things were used, in hope of success with, until three years ago, the same results—failure. Three years ago, after repeated failures, I made a solid weld with two pieces of copper. The experiment was not repeated until the following spring, when owing to impurities in the copper, I failed to make a weld. Last spring I repeated the experiment with perfect success and now, at the age of 73, I have discovered and perfected the method of welding copper."

The accompanying engravings show a picture of the veteran gunsmith and also specimens of his copper welding.

#### The Story of Iron Ore.—3

It is interesting to recall that the furnace men of the early days had great difficulty with Lake Superior ores in the furnace. The blast furnaces of those days bore little relation to the blast furnaces of today. It has been related that about 150 tons of ore were shipped to Sharon by the Cleveland Iron Mining Company in 1853. It was landed at Erie, Pa., and sent by canal to Sharon. The first boat load was delivered at Sharpsville furnace, owned by David and J. P. Agnew. Describing this event David Agnew wrote:

"The ore was used in the furnace partly alone and partly with native ores, and the experiment was highly



SOME EXAMPLES OF COPPER WELDED BY MR. BAIRD.

ed; but, with the exception of one or two persons, all said that copper probably never would be welded. I was

successful, the furnace working well and producing an increase yield of metal, which was taken to the Sharon Iron

Works and there converted into bar iron and nails of a very superior quality."

The second boat load was also brought to Sharpville, but having intended to be left at the Clay furnace, owned by the Sharon Iron Company, was returned and used at that establishment.

The first pig iron produced in the Lake Superior region was made in 1858 by Stephen R. Gay, who leased the forge of the Collins Iron Company, and converted it in two days at an expense

1858, and the second in May, 1859. A number of other furnaces followed the Pioneer, being located at various points with reference to different advantages for the manufacture of iron, one locating near a belt of hard wood, another near a limestone quarry, a third near an ore deposit, and a fourth to secure the benefit of water privileges.

The furnace history of the Upper Peninsula, however, has been one of general abandonment, the Pioneer

blow altered the face of a continent. Instead of a stubborn and rebellious mule hauling a four-ton car on a little strap railroad, there are now plying to this self-same range some of the most powerful locomotives ever constructed and the old roadbed is among the heaviest in the world. Instead of a 100-ton schooner receiving its cargo of ore upon a gang plank there is a 10,000-ton steamer being loaded by means of a trestle dock and its pockets and chutes in far

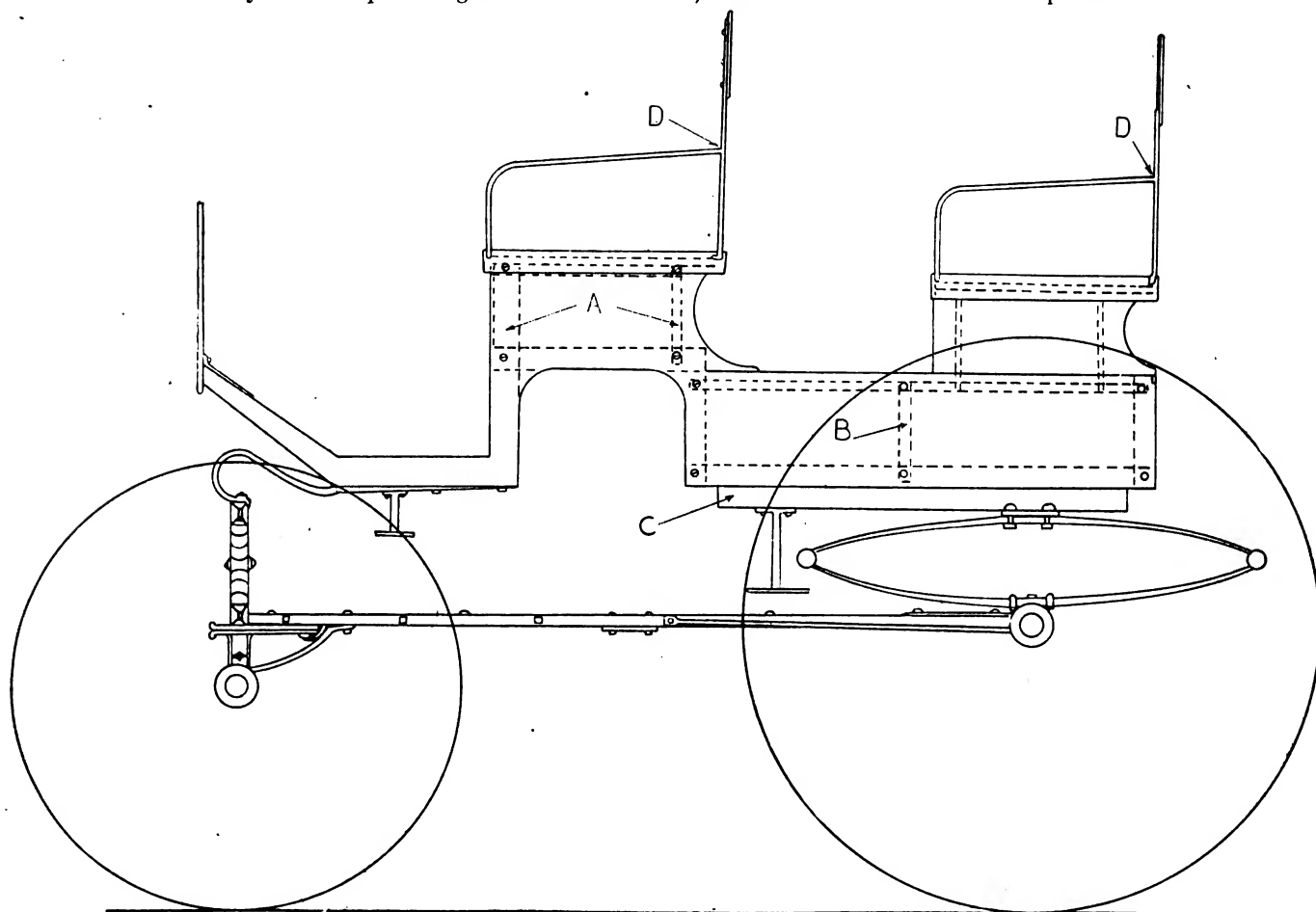


FIG. 1.—SHOWING SIDE VIEW OF GOLF BRAKE.

of \$2 into a miniature blast furnace. The forge of the Collins Iron Company was the third to be established in the Lake Superior country, having been built in 1854 by George B. Russell and others. The two which had preceded it were the forges of the Jackson and Marquette Iron companies. The pig iron produced by Mr. Gay was, of course, purely experimental. The first blast furnace in the Lake Superior region was built by the Lake Superior Iron Company, at which is now the city of Negaunee. It was called the Pioneer furnace. Work upon the furnace was begun in June, 1857, and was finished in February, of the next year.

The first stack of the Pioneer Iron Company went into blast in April,

being the only one of the early furnaces to have survived. One can wander into wilder portions of the Marquette range today with a feeling that no one has ever penetrated that portion of the wilderness and suddenly come upon the remains of an old charcoal furnace with its battery of ruined kilns, embankments and roadways—mute testimonials of earnest but unrewarded effort.

A review of Peter White's life would be a review of the history of the Lake Superior country. His life compasses all that is modern in the history of that princely territory—the richest in a mineral sense that has ever been discovered. The changes since he ripped the sod off the iron ore of the Cleveland mine in 1849 have been vast. The

less time than it took to load the little schooner, and all coming from the self-same ore deposits.

To be exact, the great steamer, Augustus B. Wolvin, has loaded 10,245 gross tons of ore at the Great Northern docks, Allouez Bay, in 39 minutes, 9000 tons of this load were put on in 34 minutes, and the Wolvin was at dock a total period of only 180 minutes, which included shifting. Instead of an annual output of 1449 tons, there is an average output of over 20,000,000 tons, with the probability of the output reaching 30,000,000 tons during the present year; instead of a freight rate of \$3 to \$6.25 per ton from Marquette to Ohio ports, as it was in 1866, there is the present trip to trip rate of 75





year and then plan to have work which will fill up the time in slack seasons. This work may take the form of building new wagons or sleighs, or doing artistic iron work in case the smith or his helper has a taste in that direction, and there is a market for the product. Whatever the sideline is, it should be of such a

some very important work to make a sod-cutter blade for a gentlemen who was in a great hurry for it. The blade was made and bolted to the frame of the machine which had also been made in a great hurry by the carpenter. The whole machine was then left out in front of the shop till the grass grew up

found out that the other smiths had a habit of going fishing about two days a week and were troubled with "dizziness" the rest of the time. I started under these circumstances of doubt, tried to do my work well, stayed at home, went fishing about once in two or three years and I soon had customers from five or six of the surrounding towns. I am the only smith in town, my nearest neighbor smith being seven miles away. I do all kinds of work done in any shoeing and wheelwright shop.

Here is a partial list of my prices:

Horseshoeing 4 new shoes.....	\$1.00
Toeing 4 old shoes.....	.70
Sharpening 4 old shoes.....	.50
Bar shoes per pair.....	\$.75 to 1.50
Buggy tires 4 new.....	4.00
Setting 4 old tires.....	1.50
Wagon tires according to size from .....	\$6.00 to 20.00
Buggy spokes.....	.15 to .25
Wagon spokes.....	.25 to .50
Wagon Pole.....	2.00 to 3.00
Rimming buggy.....	3.00 to 4.00
Rimming wagon.....	4.00 to 10.00

I read a great deal, especially from our western brothers about plow repairing. We of the New England States do not have a chance to do this work as our plows are made of cast iron and cast steel and all the repairing is done at the factory.

There has been considerable controversy in the journal about repairing sarven wheels. I have tried all the different ways and I am not satisfied with any, but think I like the method of removing only half the rivets at a time.

A word for THE AMERICAN BLACKSMITH. I think it is the best trade journal I have ever heard of and would not be without it for a good deal.

#### A Labor Saving Device for the General Shop.

J. H. HANFORD.

For the handling of heavy tires, wagon bodies and the hundred and one other clumsy things we are called upon to handle I arranged a device as follows: I ran a  $\frac{3}{4}$ -inch rod from one end of the shop to the other, being careful to securely fasten the rod at each end in one of the stout posts supporting the wall of the shop. I then purchased a set of small self-gripping pulley blocks and hung them on this rod. Further explanation of this device is unnecessary, but a few pointers as to how to elaborate upon this arrangement so as to make it strong enough for a long shop will not come amiss. Make several L shaped hangers, (the number to be determined by the length of the rod and the weight it must support) with a small upright turned up on the end of the foot part.

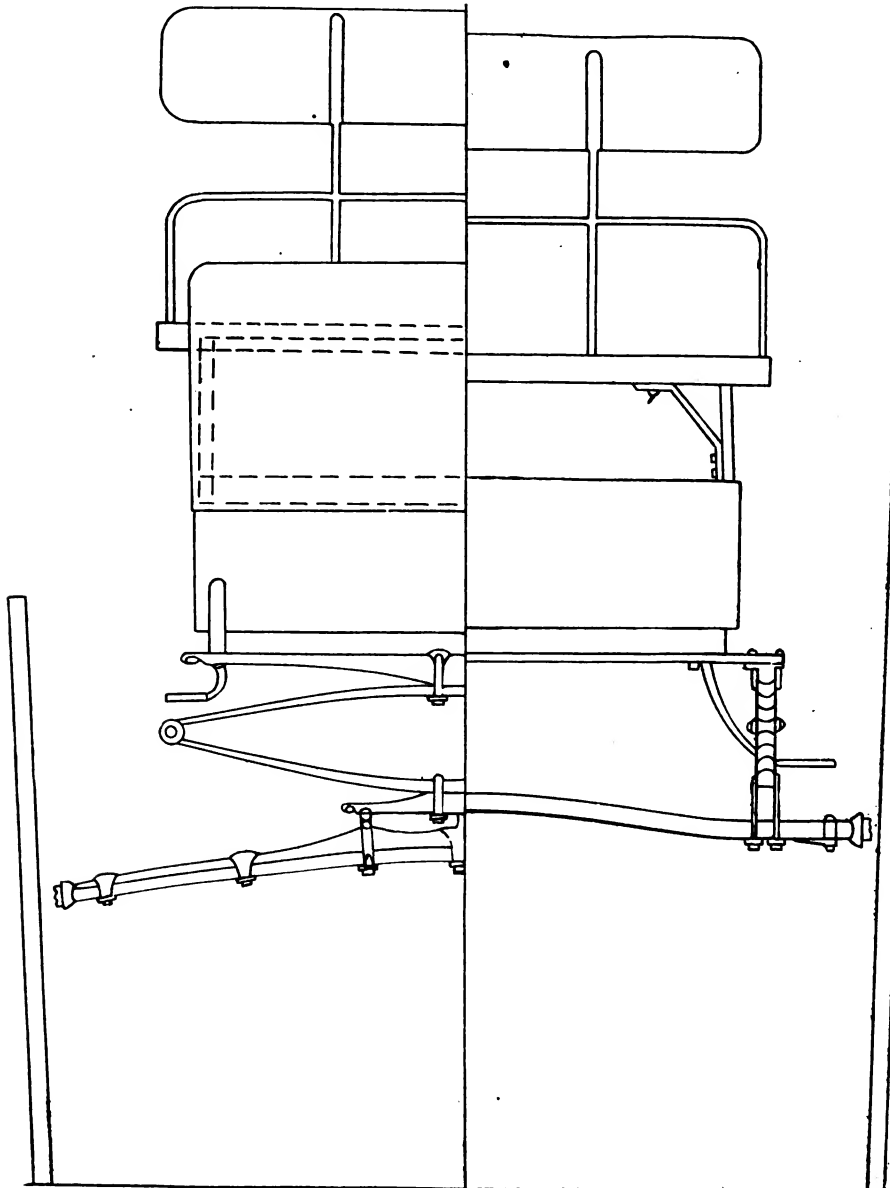


FIG. 3—SHOWING FRONT ELEVATION OF GOLF BRAKE.

FIG. 4—SHOWING REAR ELEVATION OF GOLF BRAKE.

nature that it may be dropped at once when a team is brought in to be shod, or other work presents itself. The smith who is always ready to help in case of need, who gets out work as soon as possible and always on time, is the man who is liked and who will be patronized.

Of course, there is the other side of the story. The case of the man who is in a great hurry to have something done and who exacts a promise from the smith to have it done at a certain time and then goes home and forgets all about it. The writer once dropped

through and around it and hid it from sight. No use to get mad or to say anything—better laugh to yourself and saw wood—I mean, of course, pound iron.

#### A New Hampshire Shop and Price List.

P. M. WRIGHT.

I have just erected a new shop in a small country town of about 500 inhabitants. I came to this place a little over four years ago. People told me I could not make a living, as other smiths had failed to do so. But I

Now weld these to the rod, at regular intervals, in such a manner so as not to interfere with the hook on the pulley when this is moved along on the bar. The pulley hook may also give place to a small wheel arrangement by which the work, after being raised from the floor, can be easily moved to any section or department of the shop.

Should the craftsman have several departments to his shop, such as, painting, wood working etc., this simple one rod arrangement can be so elaborated with other rods or tracks and switches, as to allow a piece of work to go from one department to another with little or no trouble at all.

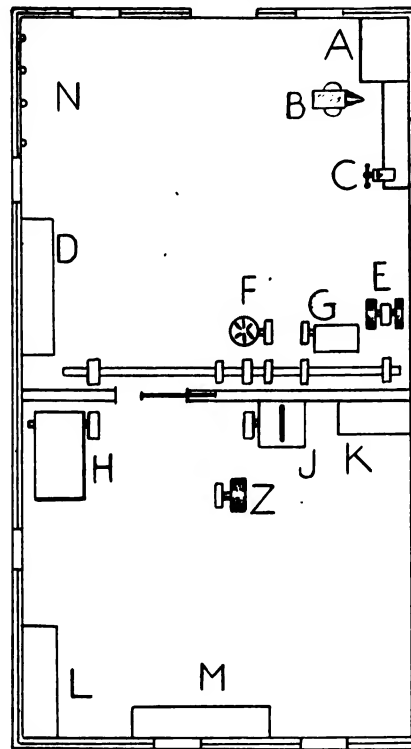
### How to Make a Slip-Socket With Jars, Rope Socket and Sink-er Bar Complete.

L. R. SWARTZ.

These are for use where the cable has not been broken below the surface. The socket is made as described in a former article with the exception that the bail of the slips is set back at the top to be out of the way of the drill cable. It plays between the cross bar shown in the back and side views of the tool and the tip of the scarfed end of the back rein of the lower jar link which is set out a trifle to form a stop. A  $\frac{1}{4}$ -inch hole made in this tip permits a wire being passed down through the set back of the slip-bail, to and around the cross bar to keep slips in place out of the way of the drill cable. Ways should be made in the band of the slip-socket so as to have a clear passage for the drill cable.

After setting this tool on iron in the well, considerable strain is placed on the drill cable and the jars. The fishing tool is brought into play by means of the

sufficient serving of twine or copper wire. For use with rods or pole tools, a suitable joint may replace rope socket. Four feet of sinker is about right. The



A WELL EQUIPPED SHOP.

stroke of the jars on this tool should be the same or over the medium stroke of the drilling rig for rod or pole use. For use on rope, less stroke on the jars will do. It can also be operated by hand by passing the rope over a suitable overhead sheave or pulley and getting 3 or 4 men to spring lively on the jars. Very little jarring is required to move the iron where one is aided by the great strain on the drill cable. To get the tool to place in hole, release the drill cable from the

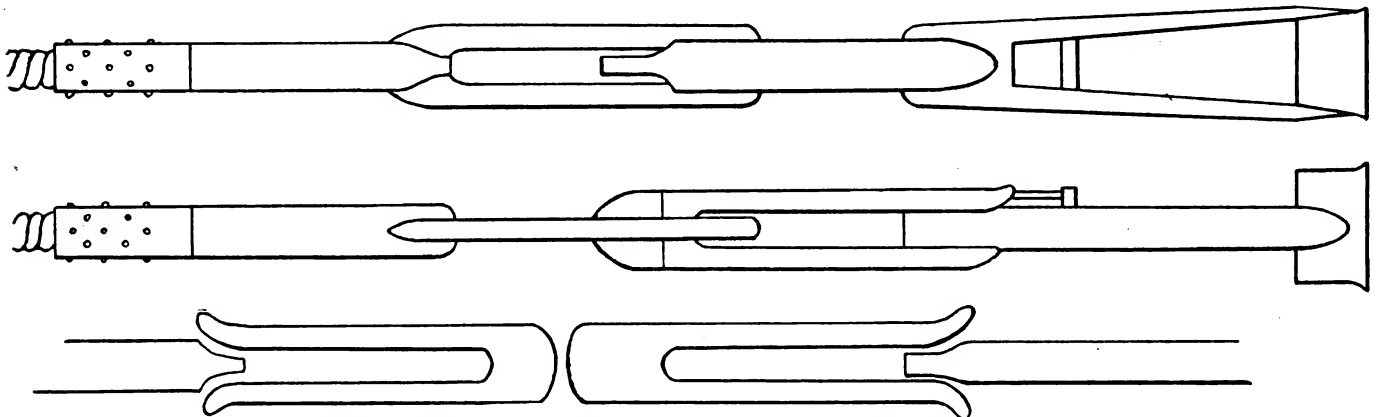
The above sizes of iron will make a tool capable of being used in a 5-inch hole or larger. And if well made, and of good stock they will move almost any weight of iron carried on a portable machine. The rope socket is made of  $2\frac{1}{2}$ -inch extra strong pipe. The sinker bar is of  $2\frac{3}{4}$ -inch round stock and for the upper link use three pieces of  $1\frac{1}{2}$ -inch square bar. After welding the tongue, which is 6 inches long, commence  $2\frac{1}{2}$  inches from tip and draw to  $1\frac{1}{2}$  by  $4\frac{1}{2}$  inches. The lower link is forged from 1 by  $2\frac{1}{4}$ -inch bar and the slip socket reins are also made of the same stock. The collar or band of the slip socket is made of 1 by 4-inch bar. The upper end of the reins of the slip socket are scarfed to  $1\frac{1}{2}$  by  $3\frac{1}{2}$  inches for 4 inches from their tip. The link of the jars is then welded to the upper end of the reins.

### A Well Equipped Wisconsin Shop.

G. E. WICKLER.

The accompanying engraving shows floor plan of my shop. A, represents the forge; B, the anvil; C, a work bench with vise; D, an iron rack; E, an emery stand; F, a drill press; G, a Wonder Disc Sharpener; H, a 3-H. P. Stover gas engine; Z, a grind stone; J, a circular saw; K, spoke rack; L, a bolt rack; M, a wood rack; N, the shoeing floor.

The gas engine is a great help and is the nicest thing I have ever seen. I put in all of these machines last spring, except the drill press which I changed from hand to power by putting a pulley on it. The entire shop is 24 by 50 feet, divided by a partition, making the wood room 24 by 20 and the blacksmith shop 24 by 30. The engine is in the wood room as it can here be more easily kept



HOW TO MAKE A SLIP-SOCKET WITH JARS, ROPE SOCKET AND SINKER BAR COMPLETE.

walking beam or any other device at your disposal. Twelve to fourteen inches of rope socket, with four or five  $\frac{3}{8}$ -inch rivets is enough and the size given will receive  $1\frac{1}{2}$ -inch rope with

drum on the machine and pass it up through the socket as indicated in the side view. Now lower the tool into the hole and set to the iron by a few blows of the jars—striking lightly.

clean and free from soot.

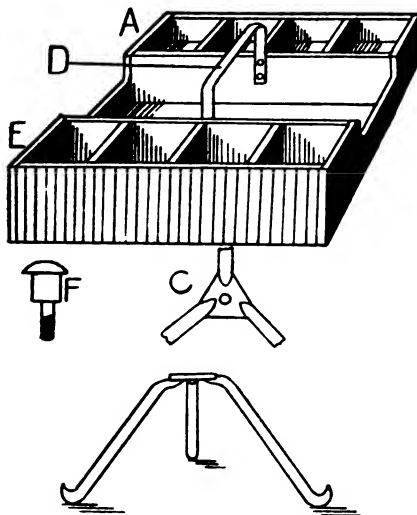
I built this shop and business, since 1897. Started in a little tumble-down shop that I bought. It was ready to fall over. In spite of the fact that I am

almost entirely deaf, have a family of 8 children to support, I now have a fine two story dwelling, fine family, garden pasture for 2 cows, shop 24 by 50 and stone basement under  $\frac{1}{2}$  of shop. Of course, I am paying interest on \$1,300 but I would not sell for \$5,000. I cannot say that I have made a big pile, but you can depend on it I have been busy. This is only a small town of 300 population. I have to depend entirely on farmers for my trade. Had to borrow \$50.00 to pay down on stock and tools when I started and rented the old shop the first year, then I borrowed the money and bought the place. When I built this shop, people said I was foolish to put up such a building here, but I believe it pays to do things right and get out of the old rut.

### How Sam Made an Automatic Shoeing Box.

C. W. METCALF.

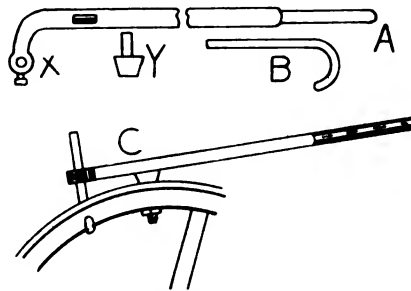
Sam's shoeing box was in very bad shape. It had been patched and repaired until there was very little left of the original box. Now Sam isn't a Tom Tardy by any means, but he had to use the old box until he schemed out a new one. He had always said that the old box was about as unhandy as anything in the shop, so after planning and scheming for about a week, Sam built a shoeing box as shown in the engraving. The stock he used was  $\frac{1}{2}$  by 12-inch board. A piece about 5 feet long was used. The ends of the box are 5 inches high while the centers are 2 inches high. At the



A HANDY SHOEING BOX.

end marked A and about one inch from the top, he drove 6 small wires. These wires support the tin box G, which is made with three partitions. This, of course, is for nails. At the end E, Sam made three partitions for his paring

knife, clinch cutter etc. The handle D, was made of  $\frac{1}{2}$ -inch gas pipe bent as shown and flattened at the ends. The stand for the box was made of 3 pieces of  $\frac{3}{8}$ -inch square stock 12 inches long.



A BOLT HOLDER FOR THE WAGON REPAIRMAN.

These were welded to a triangular piece of  $\frac{3}{8}$ -inch flat stock and then bent as shown. The box itself is attached to this stand by means of the bolt shown at F. Washers were, of course, placed between the box and the stand to prevent wear as much as possible. Sam is well pleased with his new box and says that not a few of his customers have complimented him upon the device.

### A Handy Bolt Holder for the Wagon Repairman.

J. O. WOOTEN.

This tool is very handy for holding bolt heads and to keep them from turning while taking off nuts. It can be used on most any bolts and especially on tire bolts and can be adjusted to fit most any place. To make the handle, take a piece of  $\frac{1}{2}$ -inch square stock 20 inches long and forge a  $\frac{3}{8}$ -inch eye on one end, as shown at X. Now bend this eye to one side at a point  $1\frac{1}{2}$  inches from the center of the eye. Now drill a hole in the head of the eye for a set screw. Next forge the hook B, from  $\frac{3}{8}$ -inch stock 6 inches long. Now drill a hole in the bottom side of the handle,  $1\frac{1}{2}$  inches from the head and, after forging a point like the point of a screwdriver with a shank on it, drive the shank into the hole and rivet securely. Another method would be to make a square cuff to fit the handle, with a point riveted to it. This will slide up and down the handle and be even better than the stationary point.

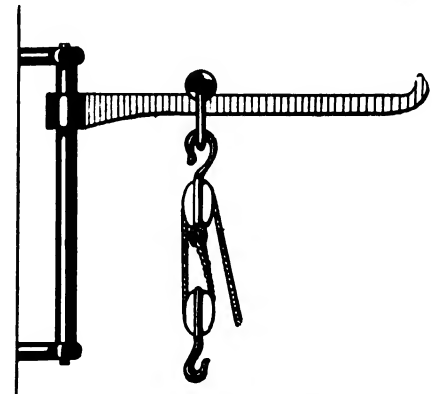
### Two Helpers for the Man Without One.

J. HARVEY HANFORD.

I have worked alone quite a little in my day and of course, had to have some help in the way of stands and other contrivances as helpers. To hold long irons in the fire or on the anvil, I arranged a crane as shown in the engraving.

The upright piece is of 1-inch round iron. Screw eyes at the top and bottom of this piece hold it to the post. The horizontal piece is  $1\frac{1}{2}$  by  $\frac{3}{8}$ -inch stock—edge up—with one end bent tightly around the upright and fastened solidly to it. The upright being loose in the screw eyes allows the crane to swing freely. A small pulley block is now hung on the crane by means of a grooved wheel and a U shaped hanger or clevis. A chain hung on the hook of the lower pulley will hold any long pieces upon which you are working. The contrivance is also used to raise or lower work to and from the fire and anvil. The arrangement is very easily made and is very much of a labor saver for the smith.

A portable rest for use anywhere about the shop, I made as follows: I procured the legs of a sewing machine and bolted a  $1\frac{1}{2}$ -inch wood block between them at the top, spreading the legs at the bottom so as to make them stand solidly. I then bored a  $\frac{3}{4}$ -inch hole through the wood block. Now I welded a thick nut on one end of a piece of  $\frac{3}{4}$ -inch water pipe and then after drilling a hole in the nut to receive a thumb screw, I placed the piece of pipe in the hole in the wood block. I then



A HANDY DEVICE FOR THE GENERAL SMITH.

made a T rod of  $\frac{1}{2}$ -inch round stock and after bending both ends of the arms slightly upward I placed the rod in the pipe. By means of the thumb screw it can now be raised or lowered to suit your convenience and the stand can be carried to any part of the shop.

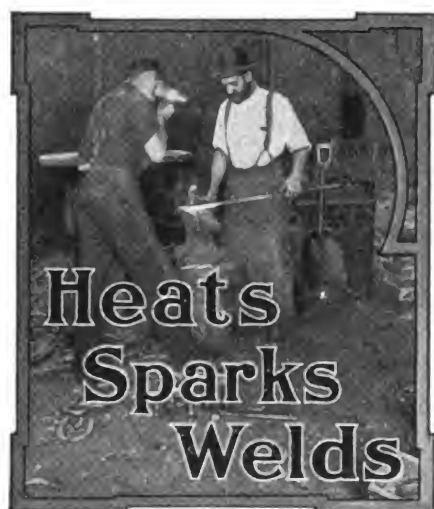
Now a word about doing work. Do not, under any consideration, overlook the little things that come your way and the big jobs you will find are easy enough. For example, a customer will agree on a price for a given amount of work, but while repairing the job you find some piece of work you had not figured on. Just put in the extra and 9 out of 10 customers will pay the extra and go away satisfied.

**Tubal Cain.**

CHARLES MAKAY.

Old Tubal Cain was a man of might  
 In the days when the earth was young.  
 By the fierce red light of his furnace bright  
 The strokes of his hammer rung.  
 And he lifted high his brawny hand  
 On the iron glowing clear,  
 Till the sparks rushed out in scarlet showers,  
 As he fashioned the sword and spear.  
 And he sang—"Hurra! for my handiwork!  
 Hurra! for the spear and sword!  
 Hurra! for the hand that shall wield them  
 well,  
 For he shall be king and lord!"

To Tubal Cain came many a one,  
 As he wrought by his roaring fire,  
 And each one prayed for a strong steel blade  
 As the crown of his desire.  
 And he made them weapons sharp and  
 strong,  
 Till they shouted aloud for glee,  
 And gave him gifts of pearl and gold,  
 And spoils of the forest free.  
 And they sang—"Hurra! for Tubal Cain,  
 Who has given us strength anew!  
 Hurra! for the smith, hurra! for the fire,  
 And hurra! for the metal true!"



Want of diligence causes more failures than want of means.

Look before you leap, but act when the time for action arrives.

That garden—now's the time to start it. Get the youngsters interested.

A modern smith with modern tools in a modern shop means business success.

A good shop picture is always welcomed by the editor. Have you sent in yours?

Ready for the spring rubber tire rush? Prepare now—many new catalogues out.

Occasionally remind your customers that prompt pay is paying when the bill is due.

Business success depends in a large part on your ability to make friends and to hold them.

When melting metals, cover them with charcoal only—both coal and coke contain impurities.

"Attention to quality always buys better tools than attention to first cost," said friend Thornton.

Tell your brother smiths what the paper has done for you. Then give them a subscription blank to sign.

A hand saw is a good thing but not to

shave with. Proper tools for the work at hand is half the battle.

He needs it. Your brother smith will thank you for getting him to read THE AMERICAN BLACKSMITH.

Let the boy figure and plan some things for himself. An ounce of experience is worth a pound of coddling.

"Brother, take care of the shop, the home will take care of itself." Thus speaks a successful South Carolina Smith.

Get the habit of regularly sending an interesting item to the editor. It will help others as others have helped you.

Man is gifted with two eyes and two ears but only one mouth. Do you overwork the latter or are all equally developed.

Horseless vehicles in your locality? Many smiths make a neat sum repairing broken down touring cars—why not you?

Cultivate cheerfulness. A laugh is worth a hundred groans in any market. And no one wants to trade with a grouchy man.

Roomed off the emery wheel yet? It will save your other tools and machines. Of course, your wheel isn't ground full of ditches.

"Never too late to mend," said Tom, as he patched up the hole where snow and cold have been coming in these past four months.

The time to put in that line of agricultural implements, as a side-line, is now. Tell your farmer customers to reserve their orders for you.

A York State smith that we know, allows ten per cent. off on all repair work if paid for when work is done. "Works to perfection," he says.

Agitate now for a raise in prices next spring. Organization and co-operation will do wonders when you start the ball rolling. But get it started.

"This is the first place I have seen shoers use a draw knife for trimming the foot. It seems to be the custom however." Thus says a shoer recently moved to Florida.

Is it inviting? Your's shop's appearance—your own appearance—the helper's, appearance—the appearance of your stationery—ever realize the importance of it? Learn to see yourself as others see you.

How do you treat your vise? Allow it to cry for oil occasionally—use the tail end of it for an anvil—allow the file and hack saw to scrape its jaws—rap the chips out of your file on it? It's a better friend to you.

"Dewey," the mammoth steel floating dry dock, recently completed for Uncle Sam, contains 11,000 tons of steel plates, is held together by 2,000,000 rivets and took 130 tons of red lead and oil to paint it. The dock cost about one and one quarter million dollars.

Writes a Kansas craftsman, "Find enclosed \$2.00 for 3 years subscription. I meant to send it sooner but the wagon work is crowding us every minute, owing to the large crops throughout the state. Would not do without your paper for ten times its cost. All other wagon makers would think so if they could be induced to take it for a season." Are you inducing any brother smiths to "take it for a season?" Don't lose sight of that 40,000 mark. We count on your help.

As hard as diamond is a new metal called

"Tantalum." Tantalum containing only small amounts of impurity, hammered into sheets at a red heat, is equal in hardness to the best and most carefully finished steel. Tantalum, however, greatly exceeds this hard steel in toughness, for while these hard tool steels are brittle, tantalum can be rolled into sheets without injury. The new metal in its purest state unites therefore the hardest of the best steel with a greater toughness and ductility than is known to be possessed by any other metal.

Chrome nickel steel used with a small percentage of carbon can stand 140,000 pounds of tensile strength to the square inch and yet possess a very high elastic limit. Other treatments produce in it just the right qualities for use where great deflection, torsion and tensile strains must be resisted. The adaptation of chrome nickel steel to automobile construction is one of the marvelous modern advances in this direction. It is many times as expensive as the next best grade of steel and machining it, is a difficult piece of work.

The total wealth of the blacksmiths, in America, has been estimated as exceeding one billion dollars. Tom Tardy does not figure very prominently in this total, but the combined influence of the smiths who attend to business and are pushing their interests means a good deal. State legislators in the matter of lien laws are compelled to give heed to their demands. Let members of the craft appreciate what their combined efforts mean in influence and money, and you will be able to get your interests properly taken care of in each state.

"Over sixty letters in three days," says a smith who used our want columns a few months ago. We offer space at reasonable rates, to those of our friends who wish to buy, sell or exchange something. Many have sold their shops, and secured bigger and more modern establishments through our for sale columns. Others have secured help and machinery, while still others have secured positions. If you want to buy or sell shop or tools or want a helper, place an ad in our want columns. Surely you'll find one among 25,000 looking for just your proposition.

A Recent Patent is for an improved machine for bending and straightening angle-irons, T-irons, channel irons, rails and other metal bars and beams.

The machine is constructed with a suitable framing or casing, on which three bending rollers are arranged. These rollers are each carried on a revolving spindle and are rotated by suitable gearing driven by means of an engine or motor. One roller, termed the "central" roller, is fixed in position, while the "bending rollers," are arranged at the rear of the central roller. Each bending roller can be moved along a slotted guideway through an arc of a circle by means of a cross-head which is traversed by means of a screw and wheel arrangement.

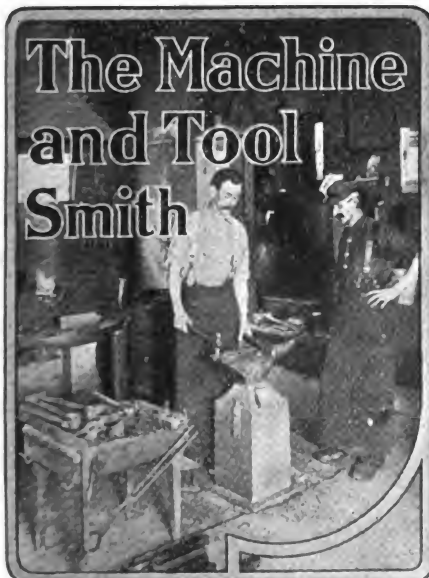
The whole arrangement is such that when an angle or other iron is passed between the central roller and the bending rollers the latter can be pulled by means of the wheel and screw gear, so as to bend the angle iron around the central roller to the curve or bend desired. During the bending operation the rollers are constantly revolved so as to feed forward the angle iron.



### American Association of Blacksmiths and Horseshoers.

The blacksmiths in a county without an association are like a team trying to pull a heavily loaded truck out of a mud hole—first one pulls and then the other. No one's strength sufficient to move the entire load, but if combined the burden would be easily moved. And price cutting and the numerous other problems are indeed "The Blacksmith's Burden". Co-operation and organization are the only remedy. Pull together and the load will move. In union there is strength—strength that will deliver the craft from its burden of low prices, incompetent workmen, long credits and dishonest debtors.

An organizer of three county associations says, "We are now enjoying the benefit of good prices and everyone is proud of it. If all the smiths would only put their shoulders to the wheel, we would soon have legislative protection and the craft would be on a plane with other trades and professions." This man knows the value of organization, knows what it will do for the craft and he is doing all he can to encourage smiths to organize. How do you stand on this question, Mr. Reader? Address The American Association of Blacksmiths and Horseshoers, P. O. Box 974, at Buffalo, N. Y., and by return mail will come plans by which to help your locality. You know that the craft needs organization, then why not put on the harness? Write today—now.



### Hardening and Tempering Steel—6.

E. B. MARKHAM.

Every degree of heat given a piece of steel affects its structure. Commencing with dead cold steel every degree of heat

it receives causes expansion. An interesting experiment can be made with a simple apparatus. Take a piece of steel or iron, A, Fig. 1, and fit a bar between the contact points as shown. This bar should be fitted so it just holds. Allow the pieces to remain in a cold

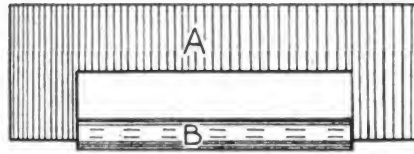


FIG. 1.—A SIMPLE APPARATUS FOR A SIMPLE TEST.

room until they are thoroughly chilled then insert the bar between the contact points as shown. Now grasp the piece A at the top with the warm hand and in a few seconds it will have expanded from the heat of the hand sufficiently to let the bar B fall. If a change in temperature of a few degrees will cause the effect just mentioned, the reader is left to imagine the effect when the piece is heated to a red heat which signifies a temperature of from 1300 to 1500 degrees Fahrenheit.

When steel is to be forged it should be given a heat that renders it easily worked, yet not high enough to injure it. If the forging heat were somewhat higher than the hardening heat, it would then be of the right degree to refine, and would restore the steel and refine the grain which had been made somewhat open by the action of the forging heat, provided, of course, the forging heat was not sufficiently high to permanently injure the steel. There is a refining heat but it is not the same in all steels. In steel containing a low percentage of carbon, this heat is higher than in one containing a high percentage of this element. A piece of steel hardened at the refining heat is as strong as it possibly can be made and anything above that heat tends to weaken it.

If by accident, a piece of steel is overheated when preparing it for hardening, it should not be quenched, but should be allowed to cool off, when it may be reheated to the proper heat and hardened.

If a delicate piece of work must be heated in a blacksmith's fire, best results follow if the work is placed in a tube to remove it from the effects of the fire, and the decarbonizing influence of the air. If the piece is so large it could not be placed in a tube, a large, high fire should be used, one that will keep the piece far enough from the tuyeres so the cold air blast will not strike it. A fire of charcoal is best when hardening, as a more uniform heat can be obtained

and coal, unless it is well coked before using, contains several elements that are injurious to the steel.

While it is folly to use a common smiths' forge for hardening large quantities of work, yet in all probability many of my readers have nothing else. For those so fortunately located that they can obtain some form of gas cheaply, I think it advisable to use some form of furnace. Such furnaces give excellent results, as the temperature may be accurately gauged and every part of the furnace heats alike, if they are properly made. There are many forms of these in common use, some made in the shop where used, while others are purchased from concerns who manufacture them for the market. Figs. 2 and 3 represent two forms that are made by reliable manufacturers. When made in the shop the design is generally adapted to the work in hand. When it is not advisable to make a furnace which will burn gas, it is possible to design one that will give excellent results and which burns hard coal, coke or charcoal as fuel. They may be made in the form of muffle furnaces if they are to be used for hardening. A muffle furnace is one where the work is heated in a muffle away from the action of the fire. While it would not be

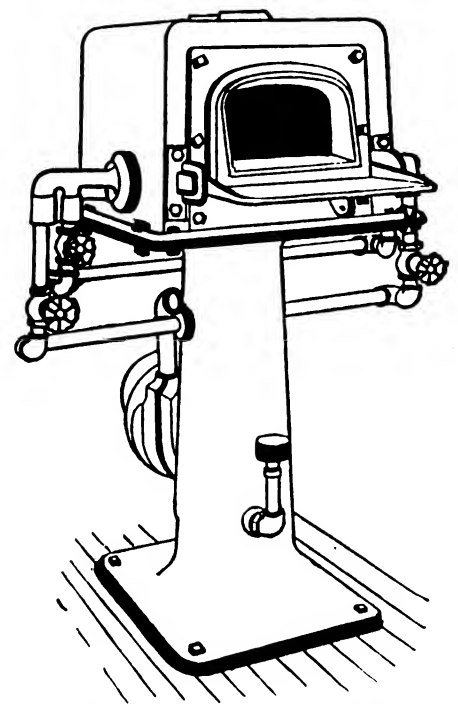


FIG. 2.—A FORM OF GAS FURNACE FOR HEATING STEEL.

possible to design a furnace that would give best results on all classes of work, yet possibly the reader might get an idea from Fig. 4 that would enable him to design one exactly adapted to his use. While it is advisable to use various

forms of furnaces adapted to the work, most steel workers, outside of the large manufacturing establishments, must use a forge and do the best they can with it. And, as previously stated, what is lack-

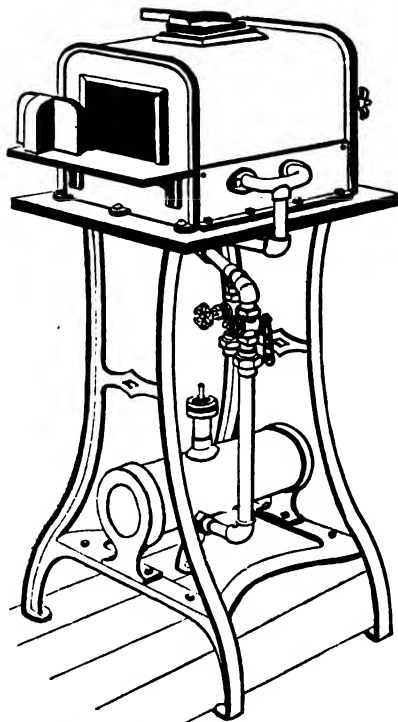


FIG. 4.—ANOTHER STYLE OF GAS FURNACE FOR HEATING STEEL.

ing in equipment must be made up in skill on the part of the operator.

One thing must be borne in mind, *i. e.* steel must be heated uniformly in order to obtain good results, as uncertain results follow unless uniform heats are obtained. At times a man will attempt to heat a 10 or 12-inch piece in a fire that is adapted to 4-inch work and he experiences all kinds of trouble. He will heat one end very hot, thinking it will cool down just about to the right temperature while the balance of the piece is heating. Now he may succeed in doing something, but the something will be just what he should not get, namely an uneven structure of steel. If such a piece must be hardened and we have no proper means of heating at hand, it would be better to heat it in a kitchen range, having a well coked hard coal, or coke fire. The writer has hardened many fine tools in this manner, and many pieces of steel in solving problems in expert work are hardened by heating in a manner that would be anything but satisfactory if many pieces were to be treated in like manner.

When heating articles that have heavy and light portions adjoining each other, it is absolutely necessary to heat slowly in order that the light sections may not be over heated before the heav-

ier portions are hot enough, and again the heat must be uniform throughout the piece, or it will crack when quenched. It is also bad practice to heat steel too slowly, *i. e.* to let it soak in the fire.

It may appear to some that a great deal is said in these articles regarding uniform heats, but it is the secret of success when hardening. If uniform heats were always obtained and cold baths were dispensed with, I think I am safe in saying that not one-tenth of the amount of steel would be cracked.

Most furnaces being hotter in one place than in others, it is advisable to change the location of the piece being heated from time to time. It is a peculiarity of pieces that are round in section, that unless turned occasionally when heating, a soft portion will develop when they are quenched. The portion that is soft will correspond to the bottom of the piece of steel as it lay in the fire, the top being hard. If it is rehardened by heating with the opposite side down, that will be soft while the portion that was hard before will develop soft spots or a streak. This peculiarity is not generally known to the craft.

Uniform heats are absolutely essential to best results and if they can be obtained in the ordinary forge, or any other fire where the contact of the article with the burning fuel is not injurious to the steel, then we are pretty sure to get good results. Of course, it is necessary to

that is not uniformly heated. This statement must not be taken as a license for over heating steel.

(To be continued.)

### Forging Machine Formers and Bulldozers.

WILLIAM J. MAYER.

The subject of dies and formers is one upon which much might be said, providing it is said in a general way. Sketches of dies and formers for illustration are impracticable as it is just possible that not one of these would meet the requirements of any one shop. This, I believe will be quite different in a few years for we now hear of a standard box car. At present it happens only too often that formers ordered for a particular piece of work, will not do when received—the article wanted having been changed in the intervening time.

There is no questioning the fact that an upsetting machine or bulldozer, is an essential factor in an up-to-date blacksmith shop. The possibilities of these machines are unlimited; the articles that can be made on these machines are too numerous to mention. We hear considerable talk about doing work with "one stroke of the machine." I am not so much an advocate of the "one stroke" idea, as of the one heat idea. I believe in doing just as much as possible in one heat. Formers and dies made to complete some articles in one

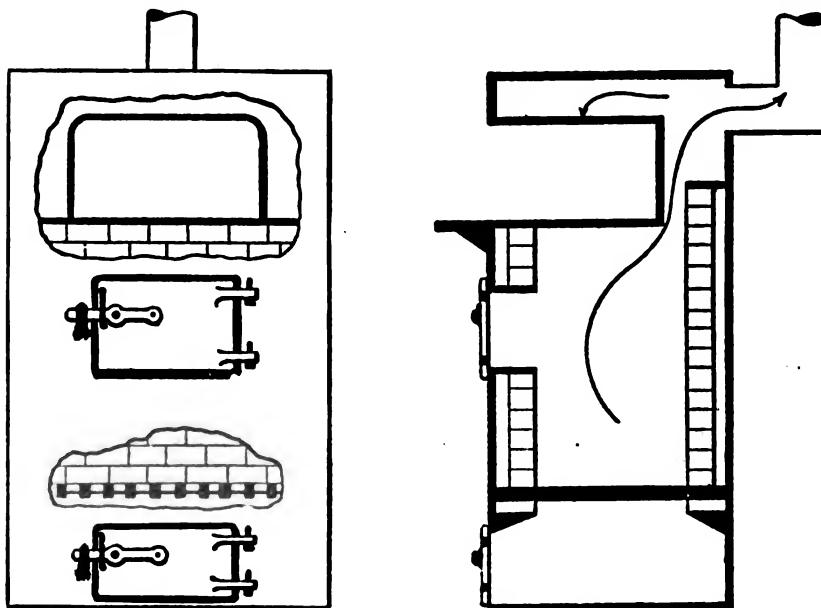


FIG. 4.—TWO VIEWS OF A MUFFLE FURNACE FOR HEATING STEEL.

heat steel to the refining heat in order that it may harden, and on the other hand it must not be over heated, or it will be coarse and brittle. But a piece of steel slightly over heated is not as liable to give trouble by cracking, as one

stroke are apt to become so complicated that the cost of making and maintaining would be quite considerable. We make some articles such as brake mast rests, dead lever guides, ladder steps or grabirons with two or three strokes of

the machine, but always with one heat. The greatest trouble we experience is with the quality of iron furnished by the purchasing department. We never



W. J. HILLIARD, ONE OF THE OLDEST SMITHS IN THE CRAFT.

know what kind of iron we have until we come to work it, and you can imagine what we think, yes, even say, when we come to work a lot of hot short iron on the bulldozer. I might say something regarding this but that is not the scope of this paper.

As to the manner of originating these dies and formers, we should never lose sight of the man behind the gun. The men operating these machines know how and what they can do. I have received some valuable hints from these men and believe in encouraging these suggestions as much as possible and when the die is a success don't say, "I made this," but rather "We made this;" it costs no more and pays well. As to the quality of the work done on these machines: I met a master blacksmith, who contended that bent hooks on arch bars were better than up-set hooks. After returning home I had one of the repair men keep account of arches repaired on account of cracked hooks, and the result was that out of 28 hooks 22 were bent and 6 upset. This I think is evidence conclusive, and no more need be said on this score. We have recently experimented with chilled cast iron dies for the upsetting machine with very good results and I believe with a saving to the company. We have entirely eliminated machine work on

these dies, using them just as they come from the foundry. There is one article in particular that I would like to mention, that is, ladder steps or grab-irons. The New York Central lines have recently adopted  $\frac{3}{4}$ -in. ladder steps as a standard and the inspector of safety appliances requires grab-irons placed on the four corners of all cars. This meant the making of thousands of grab-irons, and naturally the question of dies and headers became a serious one. Formerly these dies were made of machine steel and the header of tool steel—the time required to make them being quite considerable. We had patterns made for dies and headers, the chills being finished in our machine shop and furnished the foundry. No machine work being required, they give the best of results, being better even than machine or tool steel formerly used.

#### A Veteran Smith.

One of the oldest men in the blacksmithing craft today is Mr. W. J. Hilliard, of whom a picture is here shown. He was born in Newark, New Jersey, on the 12th of April, 1826, and has been at the anvil for 55 years. He is now located at Creston, Washington, where he is still able to turn out any kind of work in his line.

Although nearly 80 years old, Mr. Hilliard is able to do a good day's work, and work six days a week. He has little gray hair and can read without the aid of glasses. He enjoys excellent health and uses neither tobacco nor liquor in any form.

The first twelve years of his experience as a blacksmith, he worked at carriage ironing in Rochester, New York.

Mr. Hilliard says: "There were no railroads, telegraphs, threshing machines, harvesters or steel plows at the time I learned my trade, and the young men, instead of being sent to college as today, were kept at home to help on the farm, at the anvil and in the store."

#### A Typical Knee Knock.

E. W. PERRIN.

I wish to call the attention of AMERICAN BLACKSMITH readers to another typical case of knee knocking which recently came under my notice. The case in point is a horse, of the Fire Department of Little Rock, who was not only hitting his knees, but was interfering behind as a result of thrush in the frog. This is a fine looking animal only five years old. Through the courtesy of the chief of the department I was allowed to take the animal's picture, and it is

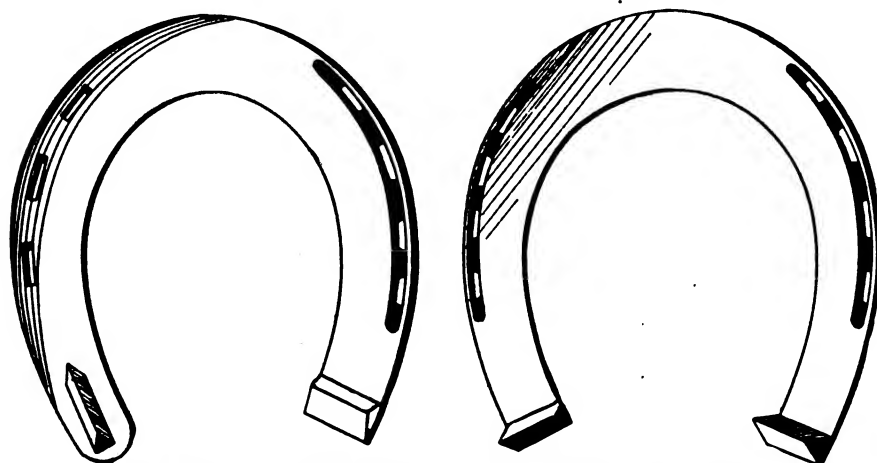
shown here in Fig. 1. The casual observer will discern no fault with this broad chest supported on a fine pair of limbs, but the trained eye of a scientific horseshoer will quickly detect the defect in the conformation of the front legs which is the cause of the interfering. Observe the perpendicular line, starting from the center of the front feet, and you see that while the base of the line is about mid way between the two feet, at the top it touches the inside of the right knee, thus showing this knee to be bent inwards "calf-kneed." Not only this; both feet are toe-wide, especially the right one, which is twisted from the knee down to the foot. If you draw an imaginary line through the right knee, it would strike the hind leg on the opposite side. As a result of this defect (the knee joint being a true hinge) the foot raises at each step behind the opposite leg, thus presenting a serious impediment to perfect locomotion. This horse was striking both knees, the defective conformation was the cause, and the problem from the horseshoers point of view, is to shoe the animal in such a manner as to facilitate clear going, to prevent the interfering.



FIG. 1—BROAD CHESTED BUT A KNEE KNOCKER.

To accomplish this end the first requisite is to level the hoof, that is, to make the plantar surface of the hoof conform to the angle of its limb. Both the hoofs

in the case under consideration are naturally lower on the inside than on the outside, the left foot breaking over on the toe and outside toe, while the right breaks over on the outside quarter. This horse was compelled to wear calks for anti-slipping purposes, so I shod him with the shoes illustrated in Figs. 2 and 3, and he has not hit since.



FIGS. 2 AND 3—THE SHOES USED ON THE TYPICAL KNEE KNOCKER.

Now about the interfering behind. I saw no fault with the conformation of the hind legs, or the shoeing, but in the foot with which he did the striking there was a bad case of thrush, the horny frog being completely rotted away leaving the sensitive frog exposed to injuries. The driver informed me that the horse only hit occasionally, but when he did, he hit hard causing acute lameness for a few blocks. This led me to the conclusion that he hit when some projection in the road injured the sensitive frog, hence I proceeded to treat the frog and protected the opposite fetlock with a boot, as soon as the thrush was cured the interfering stopped.

This is one more case emphasizing the need of a careful study of each case. If I had been hasty in jumping at conclusions, I might have tried a dozen methods of shoeing all to no purpose while the thrush—the cause—was not removed. The same holds good in the case of the front legs and knee knocking. If you cannot discover the cause you cannot scientifically apply a remedy. You may strike it right by chance in one shoeing, and miss it the next time. Hence the study of anatomy and conformation of the feet and legs is indispensable to the art of shoeing.

#### The Ideal Blacksmith Shop.

JOHN COLEMAN.

While looking over the able articles written on the ideal shop, I thought that within the coming century it would be possible to remove the great cast-iron

frames of the steam hammers and the crane posts from the floors of the blacksmith shops.

If they could be arranged on firm overhead bridgework, greater freedom would be secured on the floor of the shop, as they are great obstructions. I feel confident that this bridgework could be made so firm that it would be the ideal

place for steam hammers, unless perhaps, for the very largest hammers used in railroad shops, but I know that it is the place of the cranes. The posts are a nuisance and should be gotten rid of. We have had an over-head crane in our shop for twenty years and it worked first rate, but the frames became too heavy, so we had to build a crane to fit the shop, the roof not being able to sustain the increased weight. The posts are in the way all the same. For the kind, it is a fine crane, made of two 90-pound "T" rails, back to back, with the other attachments in proportion and capable of lifting three tons at the end of a 17-foot jib. These changes cannot be made in old and out of date shops, but when new ones are being built or antiquated ones put in shape, I think that it would be well to try and get rid of the cast-iron frames of the steam hammers and crane posts should be gotten out of the way.

I would recommend a 300-pound air hammer over the anvil at the frame fire to drive the "V" in the frame, as the large hammer is so heavy that if not handled with skill, it is likely to drive the "V" into place with a few blows and leave the weld in a bad condition. The 300-pound air hammer will not be able to overdo the work, but will do the work in proper shape; the frame will not have to be pushed over to the large hammer, and as time is the factor in welding, just turn the frame over on the anvil and drive the "V" with the air hammer.

I think this will be the best practice.

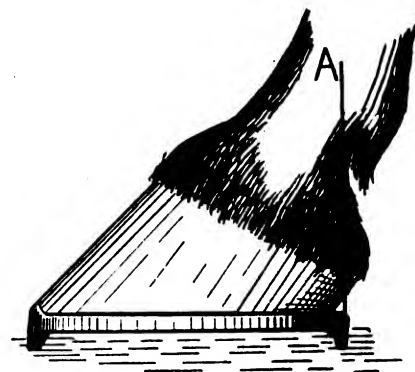
The piston of the air hammer could be made with a joint or it could be hinged at top of cylinder in order that it might be uncoupled or swung up when not in use. Or if the frame fire is in such a position that the air hammer will come in contact with the crane, have the cylinder on a truck with braces that can be quickly unfastened when not in use and run to the wall out the way of the crane when working at the large hammer.

An upsetting pit could be arranged with air hammer overhead that would be an improvement on the swinging ram, for upsetting engine draw bars, piston and other jobs that must be enlarged. The block in the bottom of the pit can be lifted out with a chain let into the sides, and when required, it can be made fast to a hook on the hammer and the air will lift the job out.

#### A Short Sketch on Horseshoeing

O. W. METCALF.

A great many men don't know what a man means when he says that he wants "that horse balanced up so he can travel." Balancing a horse means a whole lot. He must be balanced as perfectly as a pair of merchants' scales. If the blacksmith, as a horseshoer, would take care to get the inside of the foot the same height as the outside and get the shoe the right length there is no trouble. But what will the smith say when the farmer begins to kick because his horse is not shod right when you show him. Some smiths will put on a shoe  $\frac{1}{2}$ -inch too short and if the animal goes lame he doesn't know what's the



THE HORSE SHOULD BE CAREFULLY BALANCED.

matter. Some horses will wear a shorter shoe than others, because of the difference in the degrees in the shape of the hoof. Some want a long toe and some a short one. Therefore there will be a difference from 40 to 47 degrees and on a short toe you will find that the horse



will stand straighter, that is, the upper pastern joint will come more directly over the foot. With a long toe you will find that the upper pastern joint will drop back more or less. The proper length of shoe is shown in the

right on the drill, wood lathe and corn sheller, but it did not have power enough for the emery stand or feed mill. I see a great many writers are telling how they pull several machines at one time with a 2½-horse power engine and have

29.



INTERIOR VIEW OF AN ARMY POST SHOEING SHOP.

illustration. The shoe should meet the line which stands directly in center of the pastern joint at A.

An easy way to get the length of the shoe you want is to take a square and place it on the floor. Let the tongue of the square come to the center of the pastern joint and then see how many inches you have from the toe to the heel. I will guarantee that if you follow this rule you will have less lame horses. There are some of the old timers I know are well aware of this, but it will be a great benefit to all young smiths and lots of the old ones

#### More About a Gasoline Engine. A VILLAGE BLACKSMITH.

In this article it is not our intention to argue the question as to whether it pays to buy an engine, because we believe every practical up-to-date blacksmith will concede that point in favor of buying one. The point we wish to bring out is what size to buy. Our experience has taught us that a small engine 2½ or 3-horse power is hardly capable of running the average shop. We purchased a 2½-horse power engine paying \$140.00 for it. Our line shaft was 20 feet long and we had the following machines at that time: One large emery stand for plowgrinding; one power drill; one wood turning lathe; one feed mill; one corn sheller and a cord-wood saw. Of course we did not try to pull all these at once. The engine was all

power to spare. I think such statements will hardly bear investigation for we could put our engine out of business every time with the emery stand alone. We have a large floor stand and use a 2½ by 14-inch emery wheel and when we were grinding a new plow share or polishing a mould-board or any heavy grinding we were always needing more power so we concluded to get it. We traded the small engine for a six-horse size paying the difference. They allowed us \$50.00 for it; we had used it but 2 years, so you see we had to pay for our experience. We installed the new engine, put it down on a concrete foundation, pumped up the gasoline, turned on the switch, gave the wheels a turn and pop—away she went and we have never lacked for power since. We gave the emery stand a speed of 1800 revolutions and we go up against it as hard as we want to and the engine goes right along as though nothing had happened. And though you may think it impossible it will do the same work and use less gasoline than the small engine did. To anyone who understands the principles of a four cycle engine this is not so strange. The other day a customer of ours was watching the engine run while we were doing some work for him. He took out his watch and counted the number of impulses. It was going on 44 charges per minute, pulling emery stand and power drill.

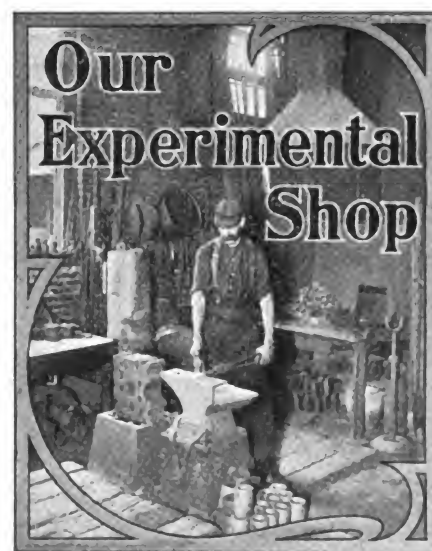
We tested the small engine time and again on the same machines and it used 150 to 175 charges per minute. Consequently its cost of operation was more than the big one on the same load. Our advice to those who contemplate purchasing a gasoline engine is don't get less than a 5 or 6 horse power. A small engine will pull you for a while but it will soon wear out. Buy one that will do your work now and also 15 or 18 years from now. If you overload them they soon wear out.

#### A Shoeing Shop at an Army Post.

FRANK WENKE.

The accompanying engraving shows the interior of my shop. This is the government shop situated at Fort Wingate. The shop is 45 feet by 20 feet. It is well lighted and, as shown by the picture, is clean.

My equipment consists of a Western Chief Blower, A Canedy Otto drill, an emery wheel and a shoeing rack which I myself built. The shoes seen on the floor in front of the anvil block, are ready fitted. These will be taken along by the drivers when the regiment takes long marches. The case shown in the right of the picture is one which I made when I was horseshoer in the First U. S. Artillery. In it are shown several tools and special shoes of my own manufacture.



Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

Try a solution of chloroform and camphor when again having a job of drilling tempered steel.

It became necessary to repack the pump on the gasoline engine the other day and instead of using rubber packing, the boss used asbestos wicking into which a good quantity

of common yellow soap had been rubbed. This, said the boss, will not be affected by the gasoline as the rubber would be.

When babbling boxes the boss always puts a piece of resin about the size of a walnut into the melted metal, stirring it thoroughly and then skimming it. This causes the metal to run better and greatly improves it.

"Did you ever have a rush job on any machine and find that the belt has waited for just this chance to slip? Well, I've found that a cake of common soap is about the best thing to apply on the inside of the running belt." Thus said a stranger while watching the man who does the machine work at the shop.

We were watching one of the wood workers put a seat together the other day and were much surprised to see him stick each screw into a piece of common yellow soap before driving. He said, grease on the screw saved grease at the elbow, and when we tried it the other evening "just for fun" we were quite surprised at the ease with which the screws worked.

The boss observed the kid using an oiler quite freely on one of the machines, and he administered the following: "It isn't necessary to give a machine an oil bath even if its tongue is hanging out and its bearings are screeching. Also remember that oil on the floor is wasted. To do any good it must reach the bearings and it won't do this unless the oil holes are clean and bright."

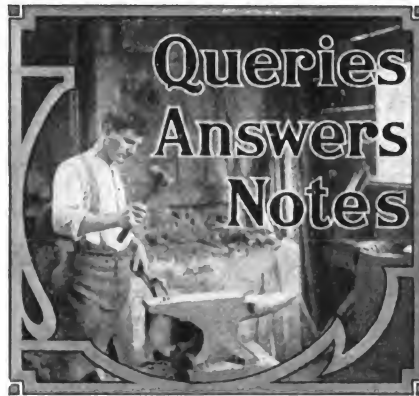
A veteran anvil-ringer of the Empire State is responsible for the following: "Some of our younger smiths have undoubtedly never tried drawing the temper from an ordinary three cornered file and using same on the anvil for cutting off iron. Get it the right temper and I have used one for months on heavy iron and with sledge and it's quite a saving of chisels and hardy."

For contracted feet they have found the following very beneficial at the shop. The upper surface of the shoe at the heels is beveled, making the inside of each heel from one-eighth to one-fourth of an inch higher than the outside. The foot thus rests on a surface which tends to spread the walls continually. "Don't ever use a knife to open the heels," said the boss when instructing the men on this matter.

A Missouri smith sends in the following kink: "An easy way to remove an old worn toe from an otherwise good shoe is to heat the toe of the shoe and place the shoe in the vice, heels down and toe calk toward you. Now put the shoe down in the vise so that by placing a square edge chisel bar between the vise jaw and the worn calk you can pry the latter off easily. This method is much better than cutting it off and it also preserves the shape of the shoe, which is quite important when a new toe is to be put on."

A Philadelphia smith tells of some very interesting experiments in welding which he recently made. He repaired a broken flatter without the aid of rivets or pins and the new piece to be welded onto the broken flatter was of tool steel. The job was done as follows: a piece of Laffitte welding plate was placed between the parts to be welded and after bringing them up to a heat they were hammered lightly but

thoroughly. The piece was then returned to the fire and, after securing a good strong heat, was again thoroughly hammered. This flatter has been used for over a month, yet shows no sign of ever having been broken. The other weld also with the aid of Laffitte Plates, was made by butt welding a piece of 4-inch shafting to a short shaft. The shaft was then turned down to 3½ inches outside diameter and bored out to a 3-inch inside diameter thus forming a collar. After machining and polishing the piece, it was impossible to find any evidence of a weld.



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**Wants to Build a Small Cupola.**—I want to know how to build a small cupola in which to melt cast iron. S. L. J.

**How to Color Gun Barrels Blue.**—Please tell me how to color gun barrels blue. Is there any way to do it without the use of heat? W. J. HILL

**Wants Number One of Volume One.**—Anyone desiring to sell a copy of the October number of THE AMERICAN BLACKSMITH of 1901 will kindly state price to B. Nelson, Toluca, Ill.

**To Build a Home-made Emery Stand.**—Can some smith tell me through THE AMERICAN BLACKSMITH how I can make a home-made emery wheel stand and turning lathe set? P. J. E.

**Regarding Cold Tire Setters.**—In reply to brother Williamson's article on cold tire setters would say I have tried several of the many machines and have found the Wolf to be the best. ROBERT JOHNSON.

**To Shoe a Horse That Forges.**—I would like to have you give me some information how to shoe a horse that forges or strikes the toe of his hind foot against the outside heel calk. E. LINDBLAD.

**In Answer.**—Shoe the horse behind with a square toed shoe having instead of the usual toe clip, a clip on each side of the middle toe. Fit the shoe so that at least ¾ of the thickness of the wall at the toe, with the edge well rounded, will extend forward beyond the shoe. The front feet should be shod with shoes that are no longer nor wider than the hoof, and the branches of the shoe, whether flat or with heel calks, should be beveled from the hoof surface of the shoe downward and forward to the front. B.

**Another on Melting Brass.**—In answer to John Tieking's query regarding the melting of brass will say that he will find it will flow better by putting in a handful of rosin after the brass has melted. C. W. GARLAND.

**Who Runs a Shop With a Jumbo?**—I would like to ask through the clowns of THE AMERICAN BLACKSMITH if any brother knows of any shops being run with power from a "jumbo" (north and south) windmill and if they are satisfactory or not. Can some one tell me? JAMES W. HAWKES.

**Melting Brass for Ferrules.**—I want to know what processes are used to melt brass so that I can mould ferrules and handles for screw drivers. I braze bicycle frames and double barrel guns without any trouble. Hope to hear from some brother in the next issue. GEO. D. WHITESSELL

**Wants a Fireproof Shirt.**—I would like to ask through your paper if some brother smith can give me the name of a firm that manufactures a shirt or frock which the sparks won't burn just above the apron. I have tried dollar shirts and \$3.50 firemen's shirts but the sparks burn them. Is there a fire-proof shirt? FAY D. WALLACE.

**Another Case of Interfering.**—I would like to ask through your paper, how to shoe a horse that strikes just above the hoof. Behind he has a spavin on one foot, but he strikes on both. I have shod him several ways but with little improvement and I would like to hear from some smith who has had that work. WM. F. KRUEGER.

**To Make Solder Stick.**—Will some one tell me what is the best method to make soldering stick to iron? JESSA A. DEES.

**In Answer.**—If brother Dees will warm his iron slightly he will usually find that the solder will stick. If this is not done the iron cools the solder as soon as it is applied to the iron. A gasoline torch is probably the handiest to heat with. This will also remove grease and dirt which also prevents perfect soldering. Use acid to clean iron if no torch is used. SOLDER STICK.

**To Forge a Grub Hoe.**—Mr. W. H. Moss, Jr. wants some brother smith to explain how to forge a double bit grub hoe. Take stock of Norway iron 2 inches by 7½ and punch a hole in the center about 4 inches long. Then take set hammer and break down at each side of the eye and close up to it. Now take the large fuller and draw the piece out wide, split each end, put in the steel blades and you will then have a good grub hoe. R. S. HENRY.

**Several Questions on Steel.**—I would like some information on the following subjects: In drawing the temper of articles, after they have been hardened by means of heating them in oil, what oil should be used? When new steel is put in a stone hammer what effect will it have on the teeth if the grain of the new piece is put in crossways to the rest of the hammer? What kind of stuff is the bone used in casehardening? If it is a chemical compound what is it composed of? GUY LAIRD.

**Hardening Calks.**—I have heard of horse shoers and blacksmiths putting metal on calks to keep them sharp. Some have the metal melted in some kind of a pot and when they get the calks sharp they dip them in the metal and then allow them to cool off.

Others will finish the shoe sharp, place a little piece of metal on the calk and heat it in the fire until it runs, then dip it in water. Now I have never seen either done but if some brother smith will kindly explain through these columns how it is done, I will thank him very much for I have often had men who came to me and wanted their shoes fixed this way. CLYDE CRAIG.

**What Hammer and Saw Best.**—I would like some good brother blacksmith to say what hammer and saw is the best. I have had a great deal of trouble with my emery stand. I bought a large stand and have never been able to get it to run true. I have paid out more than the thing first cost me trying to get it fixed but have failed. I could do a lot of saw gumming if I had a machine that would run true. I would like to know if it would be better to get a small emery stand for saw gumming. I would be very thankful if you will ask some good mechanic that has had experience with this kind of machinery. W. W. HERRING.

**He Asks Several Questions.**—First: how are we going to make a living out of the business if labor and material continues to get higher? The farmers in this part can't afford to pay any higher prices. Second: Why is it that we cannot hire a good honest man that is a good mechanic? Third: I would like also very much to know how the gun factory tempers springs. I have never seen an item in the paper that I thought was right on this subject. How are coil springs tempered, especially those made of brass? Last: If you have anything that you want to sell or trade why don't you advertise it in THE AMERICAN BLACKSMITH? It reaches the craft. C. L. HIGINBOTHAM.

**Another on Tempering Gun Springs.**—I will give a method of tempering gun springs that has never failed to give satisfaction as far as I know. First obtain a good piece of cast steel, forge to desired shape and finish up with file, but do not let any cross cut of the file remain on the spring. Then heat to a dark cherry red and chill in luke warm water. Then have some melted tallow handy, plunge the spring into it and then lay the spring on a red hot plate and hold over the fire until the tallow burns off. Then retallow and burn again and you will have a spring that will not tire or break. Do not polish the spring after you have tempered it. A. J. ROOKS, JR.

**To Temper a Pitch Fork.**—I would like some member of the craft to tell me how to temper a pitch fork after welding shank on tines. I have welded several and they are always weak and spring out of shape.

I am young at the blacksmith business. Have a shop in the country 11 miles from town and have all the work I can do most of the year. I have a power wind mill and pump water from a well 245 feet deep. I have a feed grinder and grind all kinds of feed, including ear corn and I also make corn meal. I have an emery wheel run by the mill which sometimes runs it too fast. I don't have steady power, but it does the work very well. Prices are good here for all kinds of shop work. W. A. GROVES

**An Interesting Item From West Virginia.**—I find THE BLACKSMITH very helpful in many ways, especially the hints from the brothers on shoeing as I do a good business in that line and I believe the future will be

a little better than the past has been. I think we will get better prices, though I never had much opposition here. I get more shoeing than I can well do and I get \$1.00 for plain shoes; \$1.25 for toes; \$.75 a piece for bar shoes and \$1.50 and \$2.00 for hand turned shoes. I put in a Brooks Tire Setter a few months ago and it is bringing good returns. I believe the craft in this country is on the "upgrade." I know several smiths in Charlestown who were doing shoeing for \$.80 that now get \$1.00. This has been a very prosperous year to the smiths here. W. T. WHITTINGTON.

**The Lead Bath for Tempering.**—Among the many secrets of tempering is the employment of the lead bath which is simply a quantity of molten lead in a suitable receptacle. Every one knows how difficult it is to evenly heat a piece that is three times as thick at one end as at the other. A point not found in any other kind of heat is that you can draw the temper all out say at the tong of a tool with no risk of a breakage at the water line. The great secret of temper is a uniform degree of hardness as this must be the standard to draw from.

Melt the lead, set it on the fire and keep at a red heat. As lead slowly oxidizes when red hot, sift a hand full of wood ashes over the surface and it will prevent any trouble in this line. Smiths who dabble in gun smithing must not exclude lead baths. When tempering tools keep the air from them as much as possible. Air makes fire cracks that break the tool. It is the air not the fire. E. C. JOHNSON.

**Several Questions on Cold Setting.**—In the January paper we see brother Ed. Wittiner has quite an article on cold tire setting. Would like to ask him some questions on that line. If a wheel is fellow bound do you take the tire off? You say that hot tire setting is all guess work, that you could not tell how much draw to give a wheel especially an old wheel. The tire should not be put on a wheel in this shape and if you set tires cold how do you estimate the slack in your wheel and how do you get your wheels all the same tightness? Do you use a pair of dividers and shrink to a mark? If you do, suppose one wheel had more slack than the other, how do you estimate it and how have you got any better way of guessing at the slack that is in a wheel with your way than we hot tire setters have? If you can show me that you have a better way than we have we will give it up but not before. Let us hear from you soon on these several points, brother Wittiner. S. J. PEMBERTON.

**A Pennsylvania Price List.**—I have had a good years work, have no trouble to get all the work I can do and sometimes have more than I can get through with. Neither do I have any trouble to get my money. I keep a good journeyman busy all the time and it makes no difference wet or dry, cold or warm I have work. I have a gasoline engine. It's a Dissinger and is a good one for the shop.

Some of my prices are as follows:

Shoeing 4 new shoes.....	\$1.00
Resetting .....	.40
Buggy tires, new.....	4.00
New rims.....	3.00
Shrinking buggy tires.....	2.00
Single buggy shaft.....	1.00

Cross bar.....	.50
Wagon hounds.....	2.50
Wagon axles, per pair.....	6.00
Spokes, each.....	.15
Broad tires.....	\$6.00 to 8.00

Other work in proportion. I have been at the trade for 20 years. E. L. GROVE.

**On Co-Operative Shops.**—Now, Mr. Simms the only rule that I ever heard of is one-half. The man that does the work certainly deserves one-half the cost of the job. While the way you express it on the tongue question you would lose 25 cents, but in this case the price of the tongue does not correspond with the price of the job. But suppose this is the case, and you lose 25 cents on the job. Probably on some other job the cost of the material would be very small to compare with the cost of the job, and in this way we find that to take it on an average, one-half the cost of the job will net each one a profit. You may buy an axle tree, in the rough, at a cost of 80 cents, which I have bought many at, and putting it in at \$2.50 would net you a profit of 45 cents, so you see that you will get a profit out of the axle to over balance the loss of the tongue. But there should not be a loss on the tongue in the first place, for the tongue should not cost more than half the cost of the job. But the constant increase on material, and the decrease in prices in the last ten years, makes the co-operative repair shops unprofitable to either party. M. A. FOSTER.

**On Making Plow Lays.**—We see Mr. J. M. Drew gives the readers of your most valuable paper an article on how to make plow lays. We do not approve of his way as we think we have a better way and can make brother Drew believe it. We are not condemning his way at all, but will say that we were young and were learning the trade at one time and think that a young man who follows Mr. Drew's plans will have trouble. We haven't got any pictures of our way of putting on a plow lay, but will tell the readers so they can understand it. We use the Ideal Plow Clamp which costs from 75 cents to one dollar and it is one of the best things we have ever got. It is for sale by all hardware houses. The first move is to fit the landside to the plow, the way it should be, and fit the shear to the plow, before it is welded, the way it should be. After it is welded, put the ideal clamp on the point of the shear and landside and take a good heat on the heel or where the landside joins on the plow and weld down. Take off your clamp and proceed on down with the welding. Then fit to the plow, as there will still be some to do. Then drill your holes, bolt the lay on the plow and see what a nice job you have got. S. J. PEMBERTON.

**How to Cure a Toe Crack.**—I saw in the AMERICAN BLACKSMITH, a little while ago, about a brother inquiring how to cure toe crack. This is how I cured a horse that had both feet cracked for two years right to the hair and an inch deep at the toe. When he stepped into a mud hole he immediately went lame. He was shod with bar shoes, leather soles and all kinds of things. The cracks were sewed up with nails and his feet were getting lower at the heels all the time; the toe growing out flatter, so that when you picked up the foot and caught the front of the foot and the sole between the finger and thumb, it only felt about an inch

thick. I shod him with a regular calk shoe with high heels and took the bearing right off the crack. I then put a brass plate over the crack, with brass screws  $\frac{1}{8}$  of an inch long; ten screws each side of the crack, and as the foot and plate grew down I cut them off with the nippers. When the plate grew down an inch from the hair, the crack still showed but closely together. I then put burnt leather into it, then hot pine tar and then put on a plate the width of the space. This did the trick. The crack was  $\frac{1}{2}$  of an inch wide at the toe when I started, now 8 months ago, and another shoeing will take it clean out.

P. J. O'CONNOR.

**That Tire Setting Question.**—So many articles have appeared in regard to cold tire setting that I at last bought a cold tire shrinker. Cold tire setting may be all right for new work but it is a failure on old work. Hot tire setting cannot be beat with any cold tire setter. I take accurate measurement of the wheel and shrink the tire to fit it. In most cases where the wheel is solid and has the right dish I give the tire  $\frac{1}{8}$ -inch actual draw. There are many things to be taken into consideration. I don't heat the tire any hotter than is necessary, but just sufficient so it will go on without too much trouble and I cut the ends off of tenons where they are over flush with the base of rim.

Great care should be taken not to make a buggy tire too tight but to make it just the size of wheel, with the heat between compass dots. The gypsum and alkali in this country causes a rust to form under the tire and it is very necessary to remove the tire to get the rust out and a good idea to paint the face of the rim before the tire is put back on. The face of all new wheels should be painted before the tire is set. They will stay tight longer. The hot tire drives the paint and oil into the wood and makes it water proof and prevents the rust from forming.

MILB BROWN.

**A Kentucky Price List.**—We have a shop 56 by 30 feet. We have a 5 H. P. Weber gasoline engine, a 12-inch head planer, an emery wheel stand, a rip and resaw stand, a scroll saw, a turning lathe, a grist mill and a power drill. We do all kinds of blacksmithing and wood-work. These are some of our prices:

Setting buggy tires, per set.....	\$2.00
Setting wagon tires, per set.....	1.50
Putting in wagon axle.....	2.00
Wagon tongue.....	1.00
Front hounds.....	2.00
Hind hounds.....	1.50
Fitting wagon wheels.....	2.25
Buggy spokes.....	.15
Horseshoeing.....	.80
Buggy beds.....	7.50
Buggy shafts, each.....	1.00
Hollow grinding razors.....	.50
Wagon bolsters.....	1.75
Making new wagon tires, per set.....	4.00
Making buggy tires, per set.....	5.50
Making new wagon.....	40.00
Grinding plow points.....	.10
Main springs for guns.....	.40
Plow beam.....	1.25
Plow handle.....	.40

We get out all kinds of trimming for dwelling houses and find power in the shop the greatest thing yet. DARNELL BROS.

**Wants a Good Hoof Ointment.**—I have been taking your paper nearly two years

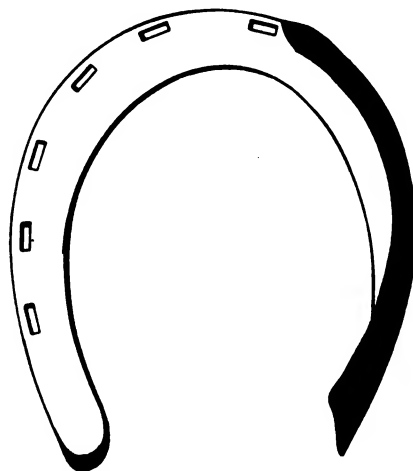
and I don't see how I could do without it. It contains so many different ideas from different writers. I will say that I agree with brother L. Van Dorin in regard to setting tires. I use the dividers all the time and find them a time saver and I don't see where brother Craig gets his idea that you have to guess at it. I have been smithing only about 15 years, but I can say that I have had about as much experience as any one, (in the same length of time) especially in buggy tire work and have had good success setting tires. As brother Van Dorin directs in filling Sarven buggy wheels, I always cut the rivets and fit my spokes in the hub by setting them in hot glue and when it gets good and dry I put my rivets in and draw the flanges good and tight and tire my wheel. I have had good luck in doing this kind of work. I want to ask some brother smith how to make a good hoof ointment to use in a dry hot climate as this is a hard climate on horses feet in the summer time.

I will give you some of the prices we get for work:

Horseshoeing, new shoes.....	\$1.00 to \$1.25
Plow sharpening.....	.10 to .20
Tire setting, per set.....	2.00
Wagon tongues.....	2.75
Wagon spokes, each.....	.20
Wagon felloes, each.....	.25
All other work in proportion.	

S. S. TRUITT.

**An Interfering Horse.**—I would suggest to Brother Davison the following method to stop the interfering horse he describes: Take a piece of  $\frac{3}{4}$  or  $\frac{1}{2}$  inch round stock, according to size of foot, bend it a little out of center, flatten and make the outside with a



FOR THE INTERFERING HORSE.

level heel, with 5 nail holes on the outside half and one at the inside toe. Flatten the inside to the quarter and raise the heel from  $\frac{1}{2}$  to 1-inch in thickness to a feather edge as shown in diagram. Bevel the shoe well from toe to heel. Pin the heel of the shoe to the point of heel of the foot and fit the shoe  $\frac{1}{4}$  inch under, say from toe to quarter of foot and heel. Now level it with foot. I have done this, when in England, with great success.

H. E. MITCHELL.

**Another Method of Making Plow Shares.**—In the January issue of THE AMERICAN BLACKSMITH I saw an article by J. M. Drew in regard to making a plow share. While I am not a professor in a University I believe

I can suggest, to beginners, some easier ways to do the job than the aforesaid article. First, don't cut out your iron or steel, buy them in blanks already forged. It is cheaper when time is an object. Around a University it isn't, but around the shop in the spring, it is. Second, hang your plow by the point of beam suspended from a hook in the ceiling by a rope. Now fit your iron landside point to the curve of the frog of the plow on the top side and a little suction to the bottom to the point. Be careful of this, as it means a great deal, after it is welded, in fitting the share to depth of running and setting the point. Now don't bore the hole. It can be done just as easy afterward and it will be clean and in the right place. Now fit the steel lay to the curve of landside point and of the top of frog of plow proper. Fit flush with iron. I see no need of grinding off  $\frac{1}{4}$ -inch and welding is no easier. Throw that old wedge clamp away and make a good pair of tongs. They won't slip and the clamp may, just when you don't want it to. Hang your plow top side up by all means, because then you can place your share on easily after welding and fit it up with the hammer, which would be a very awkward job with the plow lying on its beam or back.

W. L. ZIEGLER.

**Rubber Pads in Canada.**—I advertise rubber pads, which I use as a side line in my business, I being the first one to introduce them in this country and the only horse-shoer, as yet, that handles them. They are quite high priced for a country town and I nearly staggered some of the people when I told them what they cost. They said I would never sell one pair, but I now do quite a little business in them all through a little advertising and good work and I haven't yet been in the business two years. I had barely enough work for two fires, when I started, but now I have more than I can do and I intend to put up another fire this spring. I raised my prices for horseshoeing this fall and people said it would "kill me" but I am still in line, although the smiths all around me are shoeing for 80 cents new and 40 cents resetting. I have customers who drive 22 miles, passing dozens of shops on the road and pay me \$1.25 for shoeing.

The best advertising I have found is to do your work well. There is nothing I delight in more than to get hold of an interfering or lame horse that probably a dozen horse-shoers have had a crack at and put him on his feet. I am never stuck with any of them. I had 10 years experience in New York and it is work to the best of my knowledge and practical experience that has given me the name, and trade I now hold. There is just a word or two I would like to say in regard to the AMERICAN BLACKSMITH. I have one fault to find and that is it don't come often enough. I am looking for it long before it is due. I have found it very valuable in many cases I have had.

J. A. ROSS.

**An Interesting Letter From Tennessee.**—I am a reader of your excellent paper and I cannot do without it at all. I am 39 years old and have worked at the gunsmith trade 20 years. I have a fine trade. I keep my shop clean, have a good set of tools and do fine work on all kind of guns from the highest priced to a common muzzle loading gun. I also repair watches, clocks, sewing machines and all kinds of light machinery. I do a large custom



work for 20 miles around and credit no one. I keep no books, have no trouble with any one and am always busy in my shops. They all know I have the tools to do the work with. I gathered a good deal of knowledge from different mechanical papers but yours beats them all for information on my work.

I will give you some of my prices:

Springs from.....	\$ .50 to \$ .50
Screws from.....	.10 to .25
Soldering from.....	1.50 to 2.00
Repairing Locks from.....	.75 to 1.00
Sawing off and resetting barrels .....	1.50 to 2.00
Gun stocks.....	6.00 to 15.00
Light repairing.....	.10 to .25
Pistols overhauled.....	2.00
Trigger springs.....	.35 to .75
Main springs.....	.50 to .75
Hammers .....	1.00
Throw off.....	1.00

My shop is located 4½ miles east of Lewisburg. I would be glad for any one to visit my shop and would like to hear from any of the brothers who care to write. Address my letters R. F. D. No. 4, Lewisburg, Tennessee.  
G. D. WHITSELL.

**A Letter from a Texas Smith.**—I am now running a country shop without power and I miss the machines more every day. I will put in an engine next season and am building a power hammer now. Almost any blacksmith can make one if he will but try. When I get my hammer finished I will let the readers of this paper see how it was done by sending photographs and drawings of it. I repair shoes, do tinners work, buy junk, brass and iron and keep a stock of second hand books to sell, rent or exchange. I will also have a garden to cultivate in the spring and altogether these take nearly all of my spare time. These sidelines all pay and they don't take any time that they don't pay for.

At a country stand like mine a smith must do all of the work that comes his way or he will find a deficit in his accounts at the end of the year. Another good idea is to keep a correct account of all receipts and disbursements and to lay by the actual cost of material used on all jobs so as to be able to keep up the stock at all times. I can tell at night just what my days work has netted me the same as if working for wages.

Another idea is to learn to say no to the "never-pay-fellow" that wants a job on credit. Why should the blacksmith trust the poor-pay-man when no other business man will do so? Let him go to the other smith if he will. The more of this kind that go to your competitor, the better off you will be and his job won't be in the way when a good man brings something in.

THE AMERICAN BLACKSMITH is the only paper I ever met that just hit the spot. I learn something new from every copy I receive.  
J. A. TURRENTINE.

**Almost Half a Century at the Anvil.**—I have a good shop with a gasoline engine, and other machines to do all my heavy work. I keep two men that are good all around workmen while I just fill in on light jobs. I often wish I could do again as I once did, but if I start to do anything that would be difficult or hard for me, the boys say, "Here we will do that, and they take everything from me that has much labor about it. I

am now 76 years old and have carried on this business here since March 1859.

I have read your beautiful and instructive paper a great deal and find many grand ideas there. I also find some ideas that look very erroneous. I think there is more fake work in horseshoeing than any other branch in general smithing. I have never had any trouble in making horses travel well and we never had the experience of others to tell what to do to have a horse travel free. Experience is the best evidence, far better than theory. Young horseshoers usually think they know all there is to know about shoeing, but those same boys find, with their experience and years, that there is something to learn every day they follow the trade. In my early experience we had to make all our shoes and nails. The nails from little rods about ¾ inch thick by ½ inch wide and about 5 feet long, and sometimes we had to cut the back from an old sythe and make nails from that. We had to split our shoe bars from large bar iron. This we would generally do in the evening. Those days we had to work from 12 to 14 hours for a day's work instead of 8 hours as men do now, and if a man got \$1.50 per day he was getting big wages, while now 8 hours a day and from \$2.50 to \$3.00 is paid for a days work.  
CHARLES GALE.

**A Well-equipped Texas Shop and a Price List.**—My shop is 20 by 44 feet. I have 2 forges fitted with Western Chief Blowers, 2 anvils, 1 large steel vise, 1 wood vise, 2 work benches, 1 Stoddard hot tire shrinker, 1 Western Chief Drill press, 4 other drills, for various kinds of work, 1 Edward's steel shear, 1 Reynold's tire bolting machine, 1 Reynold's axle gauge, 1 wheel rack of my own make, 1 emery grinding machine, a good set of Little Giant screw plates, a good set of Stanley planes, Diston hand saws and Jennings's chisels and auger bits. None of my wood tools have any rust on them. I do most everything in the blacksmith line except shoe horses. Here are some of my prices:

Setting tire hot, each.....	\$ .75
" " cold, each.....	.50
Making plow shares, each....	\$2.00 to 3.50
Making lister points, each.....	2.75
Making cultivator plows, each.....	.50
New buggy stubs, 1 inch, per set....	7.00
New skeins and boxing, per set.....	6.00 to 7.50
New wagon axles, 3-inch, each.....	3.50
New wagon tongues, each.....	3.50
Buggy poles, each.....	3.00
Tongue hounds, each.....	1.00
Front hounds, each.....	1.50
Hind hounds, each.....	1.25
Wagon reaches, 10 feet, each.....	2.00
New box complete.....	18.00
New spokes, each.....	.25
New fellow, each.....	.30
New rim for buggy wheel.....	1.50
Fancy bridle bits, per pair.....	5.00
Plain bits, per pair.....	2.50
Butcher knives, each.....	.75
Sharpening plow shares, each....	.15 to .25
Lister shares, each.....	.25
Sweeps, per pair.....	.25 to .50
Sharpening well drills, each.....	.50 to 1.00

Miscellaneous work is charged for at the rate of from 40 to 50 cents per hour.

MILO BROWN, Wellington, Texas.

**Answering the Drilling Questions.**—Replying to the query of W. L. Spangler, in

the December issue, I will say that he has not given sufficient data, as to the character of the formation to be penetrated before striking bed rock in his wells, upon which to give him explicit instruction as to how to proceed. In as much as the rock seems to be very hard, the best plan for getting a square start on the rock is to send down a jack squib, composed of half or a whole stick of not less than 50 per cent dynamite, on a line so as to just touch the bottom of the hole and blow the slant off the rock. If the casing is too close to the bottom, raise it 3 or 4 feet before shooting so as to prevent damage to the lower end. Do not let the casing fall clear to the bottom (say 2 or 3 feet from the rock) when you begin to drill after shooting and start in with a light steady stroke upon a tight rope. The rope should be kept so tight that the tools will not touch the rock when running at 30 or 35 strokes per minute. By these means you get a perfectly true blow upon the rock and the tools will cut the hole down straight and true. After having drilled 2 or 3 feet into the rock, reduce the size of your bit about ¼ or ⅓ of an inch. Then if your large casing fails to shut off the cave, you can use a smaller size casing fitted at the lower end just so as to pass through the larger casing and seat itself in the funnel made by the tools after having reduced the size of the bit. This casing can be put in and driven lightly after the drilling has been done. After setting the smaller casing the large casing may be pulled out for further use.

For wells of your depth, 4 or 4½-inch oil-well casing is plenty large enough for finishing. Four-inch pipe will pass nicely through 5-inch pipe or casing, 4½ or 4¾-inch will pass through 5½-inch easily.

Ordinarily it is not necessary to drive smaller casing if the casing is kept above the tools until they are well started into the rock and then not driven too hard when set into the rock.

In work of this character much depends upon the kind of machine one has, because the rig must be such as to give the driller perfect control of his tools so as to strike a light true blow as well as a very hard one when desired and at the same time permit the driller to feel the run of his tools so as to know what they are doing. This can only be done on a machine that will drill on a tight rope whether drilling over the crown pulley or off the walking beam.

In a former number of THE AMERICAN BLACKSMITH I gave complete instructions for dressing the bits.  
L. R. SWARTZ.

**Tools and Formers for Steam Hammers.**—The steam hammer is the universal machine in the blacksmith shop and can be utilized for more purposes than any other machine we have. While it may not be as well adapted to some work as a machine especially built for the purpose, it can, with properly constructed tools and dies, be used for doing much of the work that is done in the special machine to good advantage. Again, if you have no bulldozer or bending machine you can do most all of your bending with it. The same is true with the punch, shears and many other machines in the smith shop. Now the above mentioned machines are indispensable and should be, and I think are, in every shop of any im-

portance, but the steam hammer is more important than any of the other machines that you may have, because any work that can not be made in the above mentioned machines must necessarily be made at the good old hammer. Consequently you should be well provided with good tools and formers for your hammers, for the different classes of work to be done. What I mean by good tools is not necessarily the most expensive or complicated, but tools that will do the work properly, and cost the least to make. I do not believe in making complicated formers if it can be avoided. They are expensive both to make and keep in repair. I find it more convenient when I have work to do that can not be finished in one former without much trouble, to have two and sometimes three formers to complete the job. In most cases it will make a better forging and nearly as economical, providing you do not have to take the second heat on account of it.

If you are well supplied with hammers and can keep a hammer on one job until you can finish the number of pieces you want to make, I think the formers should be made so they can be fastened solidly to the hammer. But if you are limited in number of hammers I prefer portable formers that can be used on the hammer die without removing the die from the hammer. Such formers are handy to use and the forging is easily removed from the former. It also gives you a chance to work at different jobs at the same time.

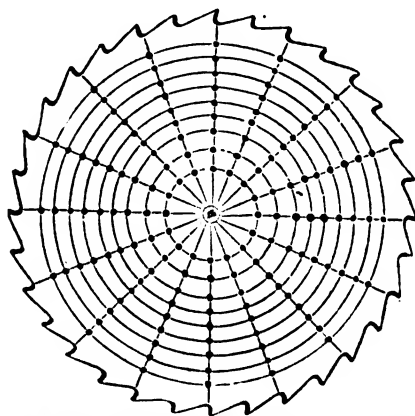
Now in getting up dies and formers there are two things always to be born in mind: First, you should know the quantity to be made with the former. If you have an unlimited number to make, then you want the best die or former that can be made for the purpose. If you have just a limited number to make, you want a former just the same, for it does not take a very large order to pay for a former of some kind, but you make it accordingly. Second, and just as important, your dies and formers should be so constructed, whether it is an expensive or cheap one, so that it will do the work properly without tearing, gaulding or in any way injuring the metal. For it is just as easy to ruin the material in this way as it is with improper heating and welding. I am afraid that many, in their anxiety to get out work cheaply and be able to say it was done with one revolution of the machine, or so many blows with the hammer losesight of this important question. There are many good pieces of metal that have been made almost useless by being stretched or pulled in the corners, until many times, it does not contain one half of its original strength, by trying to make too many square bends with one revolution of the machine or one or two blows with the hammer, whichever the case may be. The first cost of labor may be reduced somewhat this way, but the cost of repairs and waste of material will be much heavier. Such work should always be avoided, as it is a dangerous practice and is liable to cause trouble.

Gentlemen, I realize that a report on this subject is of very little value unless accompanied with prints or sketches showing the tools you are using, but owing

to the press of business in the shop, the limited time I have had, and not having received any assistance from the other members of the committee, it was impossible to furnish these. J. B. ANDERSON.

**How to Hammer Circular Saws.**—The saws should be examined by those who take charge of them, says *The Technical World*, to see what the tension is when first received. The tools required are two straight edges one from 14 to 18 inches long and another about 48 inches long; one try-mandrel; one round-face and one cross-face hammer; and an anvil.

By placing the straight edge on the saw when laid on the anvil, it can easily be seen if tension is lost. The saw should be tested all around to see if any part between the edge and the center falls away. Such spots should be marked, and should not be hammered as much as other parts, if at all. In testing for the tension, be sure to have the straight edge crossing the saw diametrically from that point of the saw that rests on the board, the opposite edge being raised by the



HAMMER AS INDICATED BY THE DOTS.

left hand, while the straight edge is held and gently pressed down with the right hand. Do not lean the straight edge to one side, but hold it up straight, or it will fall to the form of the saw and not show what is desired. A straight edge reaching from the center hole well out to the edge of the saw, is the best to use in hammering to regulate the tension; and when this straight edge is applied as above, the saw should fall away from a straight line; this will show that the center of the saw is stiff.

It is very seldom necessary to hammer a saw at the part covered by the collar. When commencing to hammer, see that the face of the hammer is ground so that the blow will be round; and do not strike too heavy, for it is better to go over the saw a number of times than to hammer too much at one operation and thus put the saw in worse shape than it was before starting the hammering.

The hammering should occur at the points indicated by the dots in the engraving. After going around on one side, mark off the other side, and repeat the operation with, as nearly as possible, the same number and weight of blows as struck on the first side and as directly over them as possible. Now, stand the saw on the floor; hold it up straight, and test it with the long straight edge. If the hammering has been done alike on both sides, the saw will be very nearly true. If, however, it shows full

on one side and dishing on the other, mark the places that are full.

Place the saw on the anvil with the round side up; hammer lightly on full places; test again with the long straight edge; and if it appears true, put it on the anvil to see if it has the proper tension; if not, repeat the operation with the round-face hammer. When it has been regulated to the proper tension, the most difficult part of hammering will have been accomplished.

Next put the saw on the try-mandrel, and test it with the short straight-edge for running true. Mark the places as they run on or off, while turning the saw slowly around. Where the saw runs off, the lumps must be taken out with a cross-face hammer, and struck in the direction that the straight edge shows the lumps to run. The saw may also be thrown out of true by lumps running toward the center. In this case, the saw will be on or off at points about opposite each other. If this part of the hammering is of the proper weight and the face of the hammer properly ground, the saw can be made to run true without altering the tension to any extent.

The testing on the mandrel should be with the full side of the saw towards the pointer; and by knocking down the lumps from that side, the plate will be made flat. When the saw is fairly flat, test it from both sides. Next put the saw on the arbor; and if to be run at a high speed it will sway gently from side to side in getting up to full speed, and may then run steadily and do its work. If it does not, but rattles in the guides it needs to be made more open toward the center. An experienced man can stand the saw on the floor, and, by giving it a sudden shake at the top edge, will know it is open toward the center if the center vibrates and the edge stands stiff. If the saw should be buckled by an accident, true it with the cross-face hammer before regulating the tension and final truing. Do the same in case of buckling caused by burned spots or sharp limps over the collar line. These may be knocked down by placing two thicknesses of strong, heavy paper on the anvil, when, by a few well-directed light blows, the limps can be hammered without expanding the metal to the same extent as if straightened on the bare face of the anvil. It is very important to have the blows distributed properly over the surface to be hammered. Hammering too much at one place causes a loose spot or lump that will be difficult to take out. In hammering with the round-face hammer, work on lines drawn from the edge toward the center. This will prevent putting twist lumps in the saw and obviate much of the trouble in truing with the cross-face hammer.

If it is necessary to go over the hammering more than once for tension, do so on lines between those that have already been operated on. The round-face hammer should have its face so dressed that a light blow would show about one-half an inch in diameter; while the cross-face should show a blow three-quarters by three-eighths inch. A sharp, cutting blow from the hammer is not effective in either knocking down a lump or stretching the metal.

It is always advisable for beginners to start in with a small circular cross-cut saw, one that can be easily handled, and to practice on this until expert.

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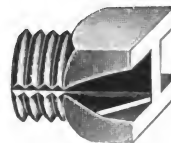
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**Prices Current — Blacksmith Supplies.**

The following quotations are from dealers' stock, Buffalo, N. Y., Mar. 10, 1906, and are subject to change. No variations have taken place since last month's quotations.  
All prices, except on the bolts, are per hundred pounds. On bars and flats prices are in bundle lots.

**Bars—Common Iron and Soft Steel.**

$\frac{1}{2}$ in. round or square; Iron, \$2.90; Steel, \$2.80	
$\frac{3}{4}$ in. " " " " 2.40 " 2.40	
$\frac{1}{2}$ in. " " " " 2.20 " 2.20	

**Flats—Bar and Band.**

$\frac{1}{2}$ x 1 in. Iron, \$2.40; Steel, \$2.40	
$\frac{3}{4}$ x 1 in. " 2.80; " 2.80	
$\frac{1}{2}$ x 1 in. " 2.50; " 2.50	

**Norway and Swedish Iron.**

$\frac{1}{2}$ in. round or square.....	\$4.90
$\frac{3}{4}$ in. " " " ".....	4.50
$\frac{1}{2}$ in. " " " ".....	4.80
$\frac{1}{2}$ x 1 in. " " " ".....	4.80
$\frac{1}{2}$ x 1 in. " " " ".....	4.20

**Horseshoe Iron.**

For No. 1 shoe, $\frac{1}{2}$ x $\frac{1}{2}$ in.....	\$2.50
For No. 2 shoe, $\frac{1}{2}$ x $\frac{1}{2}$ in.....	2.50
For No. 3 shoe, $\frac{1}{2}$ x $\frac{1}{2}$ in.....	2.50
For No. 4 shoe, $\frac{1}{2}$ x $\frac{1}{2}$ in.....	2.50

**Toe Calk Steel.**

$\frac{1}{2}$ x $\frac{1}{2}$ in. and larger.....	\$3.00
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**Spring Steel.**

$\frac{1}{2}$ to 1 in. Rounds. Op. Hearth \$3.00, Crucible \$5.00	
$\frac{1}{2}$ to 6 in. by No. 4 gauge to $\frac{1}{2}$ in. Flats " 3.00, " 5.00	

**Carriage Bolts. (Net Price per Hundred).**

$\frac{1}{2}$ x 2 in.....	\$0.54	$\frac{3}{4}$ x 2 in.....	\$0.82
$\frac{1}{2}$ x 2 in.....	.58	$\frac{3}{4}$ x 2 in.....	.98
$\frac{1}{2}$ x 8 in.....	.62	$\frac{3}{4}$ x 6 in.....	1.81
$\frac{1}{2}$ x 8 in.....	.65	$\frac{3}{4}$ x 4 in.....	1.70
$\frac{1}{2}$ x 8 in.....	.75	$\frac{3}{4}$ x 6 in.....	2.10

**PATENTS**

that pay. FREE report on patentability. Write for special offer for obtaining patents, trade-marks, etc. Best references. WM. N. MOORE, Washington, D. C.

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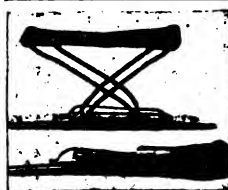
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**FOR SALE**—One 8 H. P. 4 cylinder Gasoline Motor good as new. Will sell cheap. Address, OLOF NELSON, Franklin, Minn.

**FOR SALE**—Blacksmith shop with tools and dwelling. Good location. Write for particulars. N. M. CHRISTENSEN, Box 45, Shenington, Wis.

**WANTED**—A second-hand dash sewing machine or a combination dash and trimmers machine, (or both). Must be in good order. C. J. W. FALK, Jackson, Miss.

**SALESMEN WANTED**—For extension axle nuts which cure wabbles. Make old buggies run like new. Exclusive territory. Liberal commissions. Quick sellers. HARDWARE CO., Box P 10, Pontiac, Mich.

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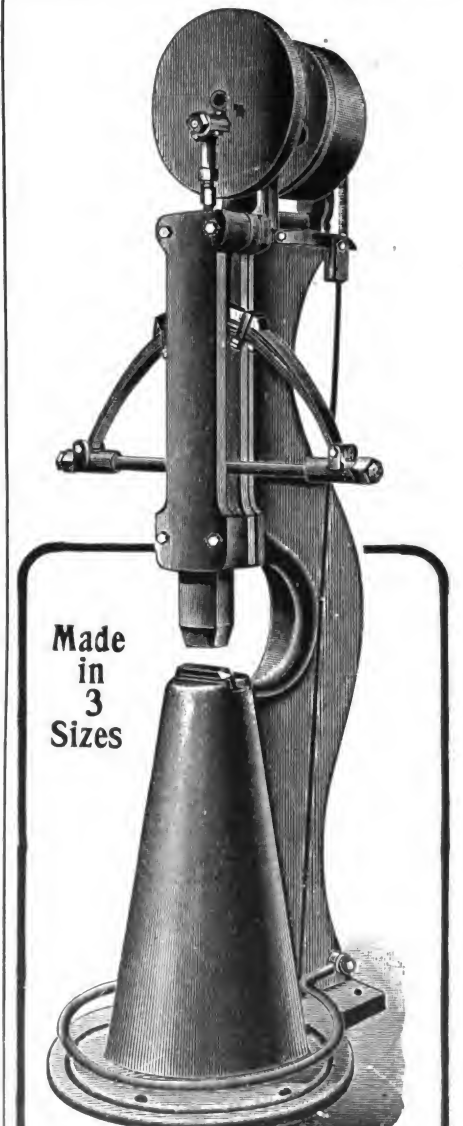
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1, 4 H. P. Chicago gasoline engine, used 30 days, just as good as new, electric spark, all set up on combined base. ....	90.00
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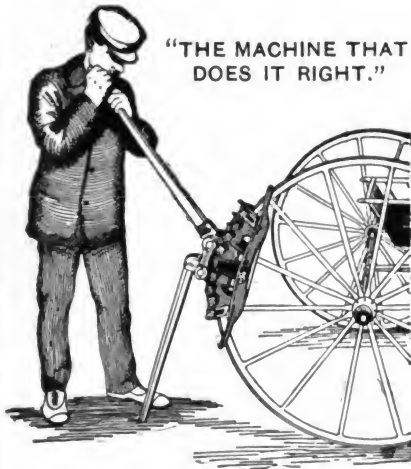
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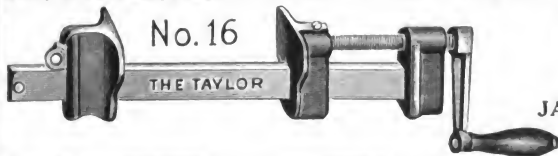
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## TAYLOR CLAMPS.

Quick-Acting, Self-Locking.

Every size and shape used in the wood and metal working trades.



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We make the following sizes:  
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This shows the  
strength of our  
**STANDARD**  
compared to  
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## The Bruce Malleable Wagon Standard

This Malleable Iron Bolster Standard has been tested thoroughly, and we guarantee it strictly as represented.

Anyone familiar with the farm wagon will readily see the great advantages of the Malleable Iron Bolster Standard over the old style.

1. Made of the best grade malleable iron. It has been thoroughly tested by factories and wagon makers and pronounced a great success.  
2. It is attached to bolster by means of two bolts passing through bolster from the side, and one bolt from top to bottom of bolster, thus holding standard perfectly solid, and at the same time strengthening end of bolster, which in old style is weakened by mortise.

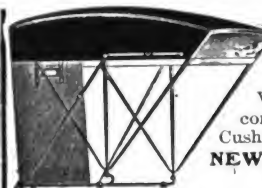
3. The Malleable Iron Standard has a 1 1/2 in. face at base, which prevents wear on wagon box, while the old style has only a 7/8 inch face.

4. Great time saver. Can be attached to bolster in one-fourth the time required to put on wood stave. Adapted to new and repair work. The price will justify all classes of the trade in using this standard.

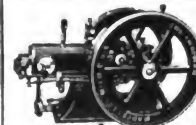
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We make a special-  
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Dashes and Fenders.  
We also manufacture a  
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Cushions. Write for prices.  
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Drives trip hammer, iron  
lathe and drill presses all  
at same time.

Safe, Strong,  
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A TEXT BOOK OF

## HORSESHOEING

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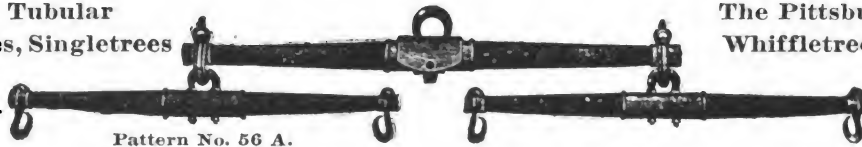
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PUBLISHERS PHILADELPHIA

### The Everlasting Tubular Steel Doubletrees, Singletrees and Neck Yoke.

No wagon or truck complete without them.

Pattern No. 56 A.



### The Pittsburg Tubular Steel Whiffletree Co.

Pittsburg, Pa.

Equipped with Forged Fittings.

### SPECIAL OFFER.

Send \$1.00 for instructions how to make DeCelle's celebrated welding preparation. Unsurpassed, the blacksmith's greatest aid. You can mix it in 15 minutes and it will be in shape for a year's use. It's a money maker.

Send \$1.00 for a valuable invention to the horseshoer, a new way to put a clipping horn on a common anvil. Easy and worth many times the small price asked. Just what you need.

Send \$1.00 and receive our method to hold a horseshoe steady while drawing a calk sharp. Your brother smiths say it's great.

These 3 valuable methods and DeCelle's Hoof-Trimming Nippers sent for \$3.00. Write for particulars. Circulars free.

We send plain instructions and descriptive circulars with each order for Nippers. They work to perfection.

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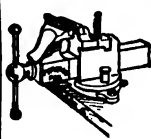
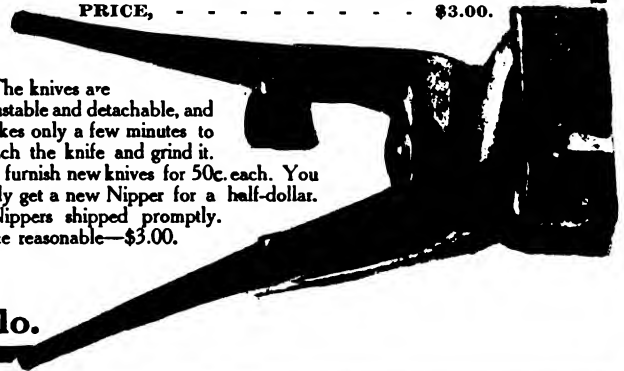
The jaws and handles of the Nippers are made of steel castings with double leverage in the handles. The knife is made of special edge-tool steel and having a shear cut, works with one-half the leverage required for the old square-cut tool. Rubber with screw to regulate it.

### THE HORSESHOER'S FRIEND DeCelle's Hoof-Trimming Nippers

The Best Tool of its kind on Earth.

PRICE, - - - - - \$3.00.

The knives are adjustable and detachable, and it takes only a few minutes to detach the knife and grind it. We furnish new knives for 50c. each. You really get a new Nipper for a half-dollar. Nippers shipped promptly. Price reasonable—\$3.00.



### PRENTISS PATENT VISES ALL STYLES AND SIZES FOR ALL USES

LARGEST LINE IN THE WORLD  
ILLUSTRATED-CATALOGUE FREE

**PRENTISS VISE CO.**  
44 BARCLAY ST. New York

It's the  
**SPARK**  
that  
Counts



Ignite your engine with our  
**IMPROVED I. C. C.**  
**JUMP SPARK COILS**  
We guarantee them against all imperfections in workmanship and material. Write us if your engine doesn't work properly.  
**INDUCTION COIL CO.**  
COILS FOR BLACKSMITHS. MILWAUKEE, WIS.

### Trade Literature and Notes.

"GADE AIR COOLED" ENGINES have met with much success in the up-to-date shops throughout the country. It is said that they are ready for business at all times—an engine you can rely upon to do your work properly. Interesting descriptive circulars are gladly sent to any address by the Gade Mfg. Co., Iowa Falls, Iowa.

THE MIETZ & WEISS ENGINES, gas and oil, are made in sizes from 1 to 70 H.P., both stationary and marine. An interesting list of testimonial letters are printed in the latest catalogue of this company, a copy of which has just come to our offices. This catalogue will be sent free to any reader of THE AMERICAN BLACKSMITH. Address A. Metz, 128-138 Mott St., New York City.

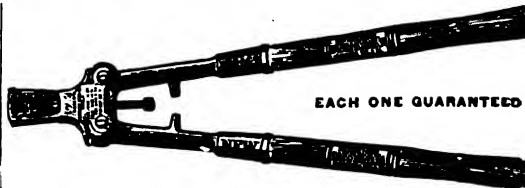
AT THE TOP OF THIS PAGE is shown DeCelle's hoof-trimming nippers which many of our readers are now using and find to be a most valuable tool. It was designed by a practical man who understands the need of improved tools in the shop. The knives are adjustable and detachable and new blades can be promptly furnished at a moderate cost.

THE FRONT COVER THIS MONTH carries the advertisement of the improved Brooks Tire Setter which is claimed to be a big money maker for the blacksmith. Tire setting is profitable work if you use an up-to-date, efficient machine. "The Brooks" is said to be strongly built for long service—a compact machine fully guaranteed. For descriptive circulars address The Brooks Tire Machine Co., Wichita, Kans.

"BUFFALO BLACKSMITH TOOLS" is the title of a neat catalogue just published by The Buffalo Forge Co., Buffalo, N.Y. This booklet fully describes and illustrates the widely used "Buffalo" Forges, Blowers, Punches, Shears and Tire Upsetters and also shows a new line of improved "Buffalo" blacksmith hand and power drills. A copy of the catalogue will be sent free to any craftsman upon request.

"HARTFORD" & "BOSS" HORSE SHOES seem to be very popular among our readers. The Side-weight Horse Shoe Co. of Hartford, Conn., the manufacturers, state that these well known side weight and toe weight shoes have the highest reputation among the trade on account of their superior quality, both in material and workmanship and care in manufacturing. This firm offers to send prepaid, a sample pair of either size or weight upon receipt of 50 cents. Circulars are free.

ON PAGE 19, The Olds Gas Power Co., in their advertisement offer to send free a beautifully colored picture for the shop. The subject is Rosa Bonheur's "Horse Fair." The size of the picture is 16 by 20 and is suitable for framing. Four cents in stamps to pay the cost of mailing should be sent to the Olds Gas Power Co., 975 Chestnut St., Lansing.



EACH ONE GUARANTEED.

### BOLT CLIPPERS

**CHAMBERS BROS. CO.,**

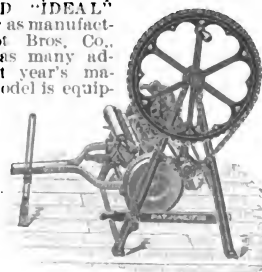
N. Fifty-Second Street,  
Philadelphia, Pa.

Mich., and you will promptly receive this handsome picture. We hope that our readers will take advantage of this offer.

SINCE 1873, The Star Manufacturing Company of Carpentersville, Ill., have been supplying the blacksmith trade with special shapes in agricultural steels. Recently the company's plant and equipment was thoroughly overhauled and modernized and they now claim to have the best equipped plant of the kind in this country. A handsome and costly catalogue has just been sent us, fully describing and illustrating the well known "Star" goods, that are for sale by all leading dealers. Friends are invited to write for a copy of this book.

ONE OF OUR NEW ADVERTISEMENTS this month is that of The Monarch disc sharpener built by the Murray Iron Works Co., Burlington, Iowa. See illustration on page 34. The Monarch is claimed to be the strongest machine of its kind on the market, the gearing weighing 150 pounds and the entire machine 325 pounds. Floor space required is only 14 inches by 14 inches and the machine can be set against the wall or out of the way in a corner. The Murray Iron Works Co., have issued interesting descriptive circulars and will be glad to mail copies to your address upon request.

THE IMPROVED "IDEAL" lawnmower grinder as manufactured by The Root Bros. Co., Plymouth, Ohio, has many advantages over last year's machine. The 1906 model is equipped with carburendum wheels in place of the common emery wheel and a separate shaft or screw rod is used, upon which the carburendum wheel slides. The Root Bros. Co. advise us that they are offering the trade a stronger, heavier and much better machine than last year, but in spite of these improvements have made no advance in prices. Descriptive circulars will be sent free to any address.



### \$33 TO NORTH PACIFIC COAST POINTS

From Chicago to Portland, Seattle, Tacoma and other Pacific Coast Points via the Chicago, Milwaukee & St. Paul Railway every day until April 7. Choice of routes. Folders free.

**Low Rates to California.** Via Chicago, Milwaukee & St. Paul Railway, \$33 Chicago to San Francisco, Los Angeles and other California points every day until April 7. Tickets good in tourist sleepers. Berth rate \$7. Tourist sleepers from Union Station, Chicago, daily at 10.25 p. m. Personally conducted tourist car parties at 10.25 p. m. Tuesdays and Thursdays.

**Move to South Dakota.** The successful crops of the past years and the exceptional opportunities still offered the farmer, rancher or merchant in Lyman County should induce you to investigate the openings there for yourself, via the Chicago, Milwaukee & St. Paul Railway. Low rate tickets on sale every Tuesday during March and April. South Dakota book and Lyman county leaflet for two cents postage.

**F. A. MILLER,**  
General Passenger Agent, Chicago.

# CHEMICALLY WELDING AT A LOW HEAT

Saving 33% in time and fuel,  
making the most difficult  
welds easily and securely by  
use of the \* \* \*

## LAFFITTE WELDING PLATES

This statement is borne out by  
thousands of enthusiastic users from  
the country blacksmith to the largest  
railroads.

You can weld anything from light  
spring steel to a locomotive frame—  
from a broken flatter to a cast steel  
engine bed.

No departure in method or spec-  
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Upon application we will send  
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Penna. Building, Philadelphia.

For Sale by Dealers.

# PATENTS

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YOUR  
IDEAS

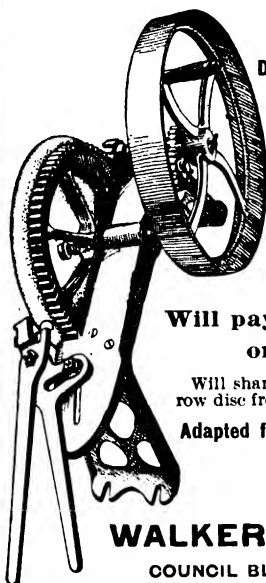
No Patent, No Fee. Consultation Free.  
Established 1864.

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852 14th St., Washington.

# PATENTS

Send sketch or model for free examination and  
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Advice free; terms low; highest references, and best  
service. Address,

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**No. 1 NOVELTY  
DISC and COULTER  
SHARPENER.**

*Every  
blacksmith  
should  
have  
one.*

**Will pay for itself in  
one day.**

Will sharpen a plow or har-  
row disc from 12 to 18 inches.

Adapted for Hand or Power

MADE BY

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We Manufacture

a Complete

Line of

**CARRIAGE TOPS  
and TRIMMINGS.**

Illustrated catalogue free,  
Write to-day.

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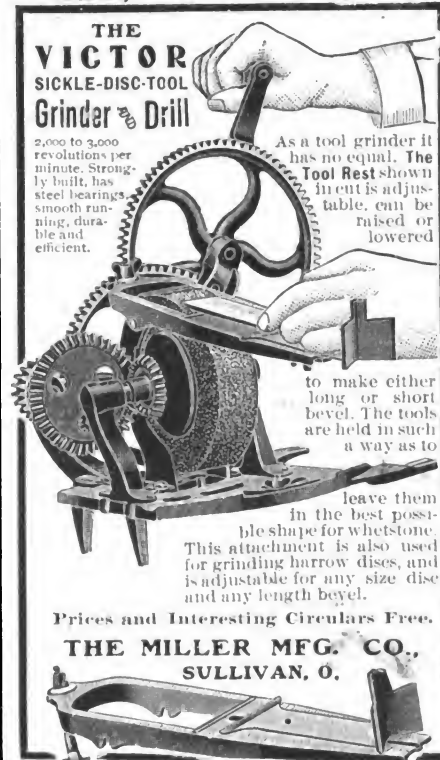
Grinnell, Iowa.



**THE  
VICTOR  
SICKLE-DISC-TOOL  
Grinder & Drill**

2,000 to 3,000  
revolutions per  
minute. Strong-  
ly built, has  
steel bearings,  
smooth run-  
ning, dura-  
ble and  
efficient.

As a tool grinder it  
has no equal. The  
Tool Rest shown  
in it is adjust-  
able, can be  
raised or  
lowered



to make either  
long or short  
bevel. The tools  
are held in such  
a way as to  
leave them  
in the best pos-  
sible shape for whetstone.  
This attachment is also used  
for grinding harrow discs, and  
is adjustable for any size disc  
and any length bevel.

Prices and Interesting Circulars Free.

**THE MILLER MFG. CO.,**  
SULLIVAN, O.

ARE YOU USING

**SMITHING COAL**

THAT IS

**Absolutely**

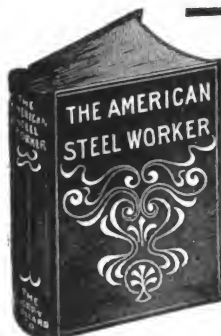
**Satisfactory?**

If not, try



**LILLY COAL CO., ALTOONA, PA.**

SOLE PRODUCERS.



# "BEST BOOK I EVER SAW"

Writes a blacksmith. Lots of  
others say so, too. Markham  
has been hardening steel for 27  
years and studying it all the  
time. He tells in plain English just how to handle  
each case. Shows the best methods; but if you  
can't get them, it tells you how to do good work  
with what you have.

You can build a first class furnace if you want  
to from his plans and use any fuel you like.

Don't think you've got this information in other  
books—you haven't. It isn't there. Other books  
may read nicely and sound well, but none of the  
authors has had Markham's experience, and that's  
what counts.

343 pages, \$2.50.

Money back if not satisfied, or sent on approval.

**AMERICAN BLACKSMITH COMPANY,**  
P. O. Drawer 974. **BUFFALO, N. Y.**

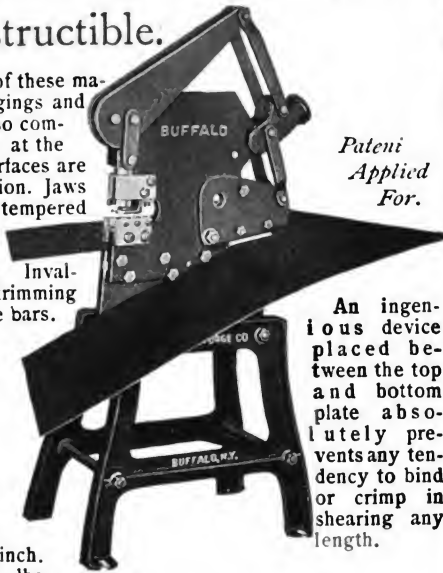
# BUFFALO Punches and Shears

Made of Solid Armor Plate Steel  
Light, Strong, Indestructible.

With the exception of stand, all parts of these machines are built of Armor Plate, drop forgings and crucible steel. The powerful levers are so compounded as to give the greatest pressure at the proper point of the stroke. All bearing surfaces are machined and carefully fitted. No lost motion. Jaws of shear are of crucible steel, properly tempered and will not give at the ends or spring. Edges will not break or "chew" under continual use at their respective ratings. Invaluable for cutting stock, roughing out and trimming work, or punching channels, angle or tee bars.

## Buffalo Punch, Shear AND Bar Cutter No. 4 1/2

Punches 1/2-inch holes in 3/8-inch plate. Shears plate of any width and up to No. 8 gauge. Bar cutter cuts off round bar from 3/4-inch to 6, and flat bar 2 1/2 x 3/8-inch. Height over all, 55 inches. Weight, 460 lbs.



*Patent  
Applied  
For.*

An ingenious device placed between the top and bottom plate absolutely prevents any tendency to bind or crimp in shearing any length.



## Buffalo Giant No. 5 Punch and Shear

Punches 3/4-inch holes in 1/2-inch plate. Shears bar iron 6 x 3/8-inch. Depth of throat 7 inches. Height 55 inches. Weight 850 lbs. Weight without wheels, 725 lbs. A high power machine especially designed for

Blacksmith Shops, Boiler Shops,  
Structural Steel Shops,

or wherever a portable Punch and Shear with the capacity of a power driven machine is desirable. Built of Armor Plate and Forgings throughout.



## Buffalo Combined Punch and Shear No. 3 B.

Punches 3/8-in. holes in 3/8-in. plate. Shears bars 3/8 x 3 or 3/4-in. round. Depth throat of punch, 4 1/4 in. Length shear jaws, 4 1/4 in. Height floor to die, 30 in. Height over all, 46 in. Weight, 345 lbs.

Shall we send you a copy of our new Catalogue illustrating our extensive line of Armor Plate Tools? All capacities and sizes, suitable for every purpose.

Canadian Buffalo Forge Co., Ltd.  
Montreal.

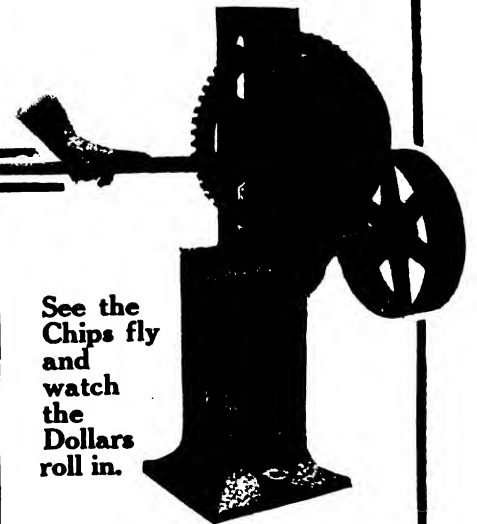
**BUFFALO FORGE CO.,** BUFFALO, N.Y., U.S.A.

*Patent Applied For.*

# THE BLACKSMITH THAT BUYS THE MONARCH DISC SHARPENER

GETS THE BUSINESS.

Don't let your  
Neighbor  
Do it First



See the  
Chips fly  
and  
watch  
the  
Dollars  
roll in.

**ORDER NOW  
and Cinch the Trade  
in your Section.**

The Wonderful Work that  
this Machine does can hard-  
ly be believed—but seeing  
is believing. . . . .

**REMEMBER** it was de-  
signed by  
a practical smith and is made by  
the oldest and largest Iron Works in  
the West.

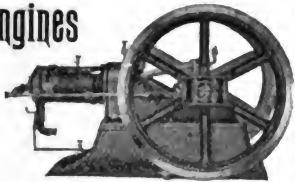
INTERESTING CIRCU-  
LARS SENT FREE.  
WRITE TO

**The MURRAY  
Iron Works Co.  
BURLINGTON, IOWA.**



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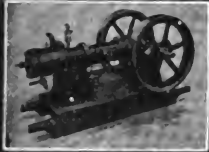
All Sizes  
Get our proposition.  
Western Malleable  
and Grey Iron  
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MILWAUKEE, WIS.



ESTABLISHED 1872.

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**HAND and POWER DRILLS**  
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Catalog Free.

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**THE "FOOL-PROOF"  
GASOLENE  
ENGINE**

The "ELI" Gasoline Farm Engine is the only fit engine to have on a farm, where one is a good way from the repair shop. The "ELI" is so simple that there's nothing to get out of order. It will run year in and year out without the tinkering that other engines require. It is the only engine without cams, gears, and levers. We call it "Fool-Proof" because, if some simpleton or a child should monkey with it, he couldn't make it dangerous. It is absolutely safe. Isn't that the kind of an engine YOU want? Then write for our free booklet, telling how and why it is so simple and safe.  
**MOLINE PUMP COMPANY, Sole Mfrs..**  
**MOLINE, ILL.**

## FROST PROOF - EASY STARTING - PERFECT COOLING - SMALL WATER SUPPLY.

Cheapest farm power on earth for running your separator, churn, washing machine, pumping, grinding feed, husking, shredding and cutting corn stalks, shelling corn, sawing wood, bailing hay, etc. Handiest and best in the Blacksmith Shop.



### STATIONARY PORTABLE SKID

All Types—2 to 20 H.P.

"LAUSON"  
Special  
on Skid.

Let us tell you more about our line of Engines and why they are superior to other makes. Write today for our large illustrated catalogue; use your letter head when writing for prices. State your wants and we will give you full information. Special agency proposition to Blacksmiths in unoccupied territory.

Mention this Paper.

The John Lauson Manufacturing Co., Dept. F, New Holstein, Wis.

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MASON CITY, IOWA.

INCORPORATED

Prices and goods right.  
Catalog free, write today.

**Universal Tenon  
AND  
Boring Machine**

for wagon repair shops.  
Cuts tenons on set of  
wheels in 12 minutes.

**Vulcan Power  
Hammer,**

Only perfect adjustable  
stroke, operated en-  
tirely by treadle.



## THE MODERN FOOT - POWER HAMMER

Takes the Place of a Helper

by the anvil, for sharpening plowshares, cultivator shovels, etc., and for nearly all kinds of general forging and welding, also for striking on tools, such as Chisels, Punches, Flatters, Swages, etc. Will strike just as light or heavy as desired by the operator, and is very easily operated. Cannot be fully appreciated until you have tried it.

Mr. A. S. Lockrem, Dear Sir: In regard to the "Modern Foot Power Hammer" which I bought of you, will say that it does all that you claim for it and more.  
Yours truly, A. F. ALLIS, Wayne City, Ind.

Write for Circulars and Prices.

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Pierpont, S. D.



## IT DOES THE TRICK!

R. F. D.  
SPECIAL



This axle runs easier than any other, and requires no attention.  
"It's a Wonder." STANDARD BALL AXLE WORKS, Ladeston, Pa.

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We supply the cast-ings, drawings and all accessories. A complete line of rough castings, also finished Motors for Bicycle, Automobile, Marine or Stationary. A 2-cent stamp gets our catalogue.



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2941 Girard Ave., Philadelphia, Pa.

## NOVELTY IRON WORKS BOSS HAMMER

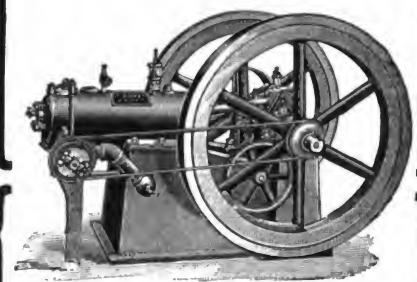


For Plow Work, Wagon Work, heavy Work, any Work.  
"I have been using your Boss trip hammer for over two years and it is almost as good as new. It has made me more money than any machine in my shop and I would not give it for any other make of Hammer. I do not see how any blacksmith can get along without a Boss trip hammer."  
Lawrence Fox, Larned, Kas.

G. E. DAVIS, Mgr.,  
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GAS AND GASOLINE  
ENGINES



(2-20 H. P.)

ECONOMICAL and RELIABLE POWER FOR THE  
SHOP-RUNNING BLACKSMITH and  
WAGON MAKER.

HAGEN ENGINES are recommended on account of their simplicity, durability, comparatively low price, small cost of operating and the ease and certainty with which they can be controlled.

Our Catalogue explains all working parts. A postal will bring a copy to you. It's free. Write today.

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**GAS ENGINE AND MFG. CO.**  
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## A RELIABLE HELPER.

### FODEN'S MECHANICAL TABLES

SAVE ALL FIGURING!

Tell at a glance how much stock to use for oval or elliptical hoops of any size, the circumference of circles, weight of flat, square and round stock, and the weight and strength of ropes and chains.

Should be in every progressive Smith's hands.  
Bound very neatly in green cloth. Price, 50c.  
AMERICAN BLACKSMITH COMPANY, Buffalo, N.Y.

*Little Giant.***A SIGN OF  
Strength and Quality****BOLT HEADER NO. 8.**

This Bolt Header is intended for heavy work, and is furnished with *steel dies* for heading bolts from  $\frac{1}{4}$  to  $1\frac{1}{2}$  inches inclusive. Takes bolts to 26 inches long. A very strong and efficient machine.



Leading dealers everywhere carry "Little Giant" Machines.

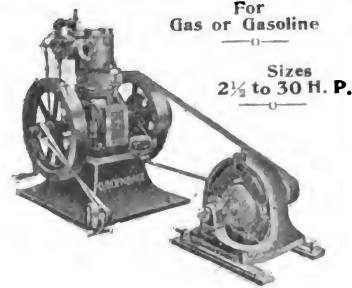
We carry a complete line of Drills, Vises, Bolt Headers, Swage Blocks and Mandrels.

Our Complete Catalogue is free.  
Fully Illustrated.

Write Today.

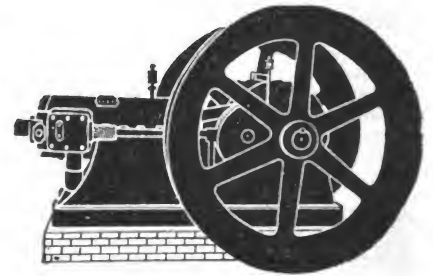
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Greenfield, Mass., U. S. A.

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**THE BEST POWER**  
For Blacksmith Shops.  
Also adopted for Electric Lighting.

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JOINTER, SAW  
AND SPECIAL  
MACHINE**

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For Sale by your Jobber.

**THE BICKNELL MFG. & SUPPLY CO.,**

Manufacturers of  
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**VICTOR  
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Quality, Durability and Accuracy. They will please you, we are sure. Send name and address today.

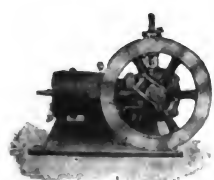
Let us send you a couple of our "VICTOR" blades for examination. No charge of any kind to you. We want you to test these blades for

**MASSACHUSETTS  
SAW WORKS,  
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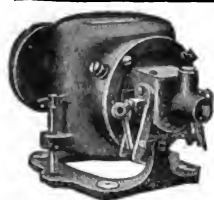


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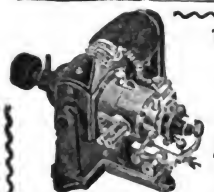
**IT RINGS  
LIKE A BELL.**



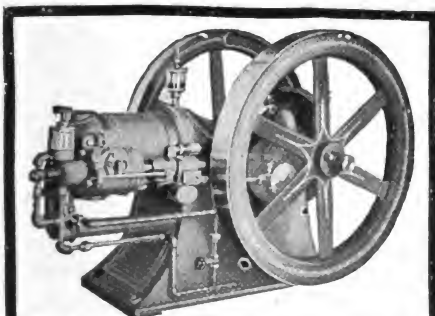
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CUSHMAN**  
3 H. P. 150 lbs.  
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Simple, Durable.  
Free Catalogue.  
**CUSHMAN MOTOR CO.,**  
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**Igniter Dynamos**  
For all Classes of  
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for make and break or jump  
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**THE CARLISLE & FINCH CO.**  
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To Gas Engine Operators.  
Dynamo Ignition.  
**Motsinger  
Auto-Sparker**  
No battery to start or  
run. The original speed-  
controlled friction drive. Driven  
parallel with engine shaft. No belts. No beveled  
pulley or beveled fly wheel necessary. For make  
and break and jump-spark system. Water and  
dust proof. FULLY GUARANTEED.  
We have an attractive proposition for the Dealer  
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Write for 32-page catalogue, FREE.  
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33 Main Street, Pendleton, Ind., U. S. A.

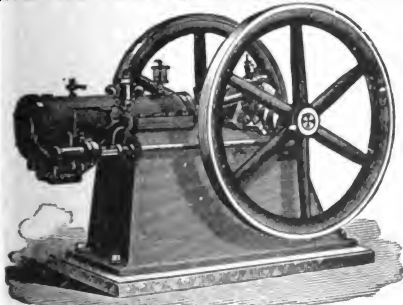


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A handy, reliable and economical gasoline  
engine for the blacksmith or machine shop  
owner. Every part fully illustrated and ex-  
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guaranteed. Ask for our free book, "Proof  
Positive," showing how the engines are used,  
and letters from the users. 2, 3½ and 6 Horse  
Power sizes for light power and farm uses.

**The Nation Engineering Co.**  
SAGINAW MICHIGAN

**COLUMBUS GASOLINE  
ENGINES**  
ARE THE THINGS FOR BLACKSMITHS



Send for Catalogue 33, Stating Horse  
Power You Need.

**COLUMBUS MACHINE COMPANY**  
Columbus, Ohio.



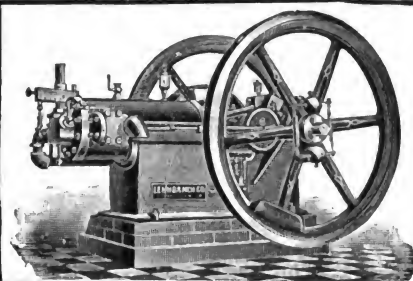
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Cyclone  
Portable  
Forge.  
Easy  
Running.  
Powerful.  
Large  
Capacity.  
Our Free  
Catalogue  
illustrates  
more  
than 20  
other styles

**CYCLONE  
PORTABLE  
FORGE**

The Cyclone Portable Forge, shown here, is a favorite every-  
where. Suitable for heavy, as well as light work. Has a 28x40  
in. hearth, large capacity coal box and a 14 in. fan. The deep  
firebox and powerful blast make the Cyclone Style No. 6 capable  
of doing the heaviest kind of work. The Cyclone has double  
Ratchet, Adjustable Legs, Solid Frame, Detachable Lever hung  
on Ball Joint and swinging in chilled seat. FULLY GUARAN-  
TEED.

Write today for our FREE Catalogue and SPECIAL INTRO-  
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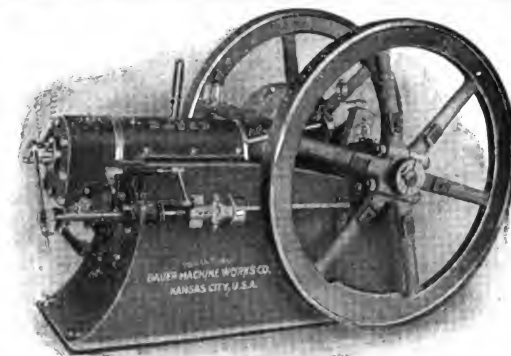


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MADE IN ALL SIZES.

Built especially for Blacksmith shop  
power. It means money in your pocket to  
find out about our engines before placing your  
order.

WRITE AT ONCE FOR NEW FREE CATALOGUE.

**Lennox Machine Company,**  
110 9th Ave., MARSHALLTOWN, IA.



**BAUER GASOLINE  
ENGINES..**

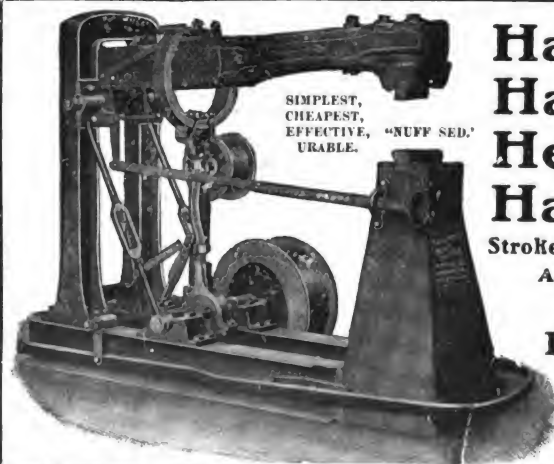
The Acme of Simplicity and Perfection.

If you will examine and compare,  
piece by piece, you will say there is no  
other quite so good as the "Bauer."  
All sizes from 1½ to 20 H.P. Write at  
once for free catalogue containing long  
list of letters from satisfied users. Our  
prices are also very interesting, con-  
sidering quality.

THE FIRST BLACKSMITH in any town who  
buys of us gets the agency for his locality, a  
discount on his purchase, and a commission  
on his sales. A good engine sells readily.  
The Bauer is the best.

Write us Today.

**Bauer Machine Works Co.**  
115-120 W. 18th St., KANSAS CITY, MO.



**Hathorn's  
Hard-hitting  
Helve  
Hammer.**

Stroke adjustable while running.

Ask your dealer or write to

**HATHORN  
FOUNDRY &  
MACHINE CO.**  
GRINNELL,  
IOWA.

100 Gallons  
30 Feet  
1 Cent



**Fairbanks-Morse  
Domestic Water Supply**

Provides all the conveniences of city water  
works at moderate cost

Gas, Gasoline or Kerosene Engines for all purposes  
from 2 h. p. up.

Cut out complete advertisement and send to  
**Fairbanks, Morse & Co.**  
Monroe St. Chicago, Ill.

Please send me Illustrated Catalogue No. W 487  
Gasoline Engines.

I may want.....h. p. to.....  
Name.....Street No.....  
Town.....State.....



## BUFFALO No. 666

## Portable Down Draft Forge

A MOST INGENUOUS APPLICATION OF THE BUFFALO DOWN DRAFT SYSTEM.

ALL SMOKE, GASES, FUMES AND CINDERS ABSOLUTELY DONE AWAY WITH.

The hottest flames and stifling heat can no longer cause the smith such discomfort as he has hitherto been compelled to submit to.

## HOW THEY WORK

On turning the crank of the powerful No. 200 Blower attached to this forge, all smoke and gases from the fire are drawn into the stack by means of the draft produced by a connection to fan case. The larger part escapes up the stack by reason of the natural and induced draft while a portion passes through the fan into tuyere. A separate connection from blast pipe into stack strengthens the natural draft and is of great service when fire is being started.

Every Forge is Complete in Itself, and Needs no Exterior Contrivances Whatever.

## NO ADDITIONAL POWER

No additional power is necessary to operate blower. In place of taking air at the fan case, blower takes it from over the fire, producing a strong draft without extra effort.

Put in a Buffalo No. 666 and keep the Smithy Clean, Cool and Light.

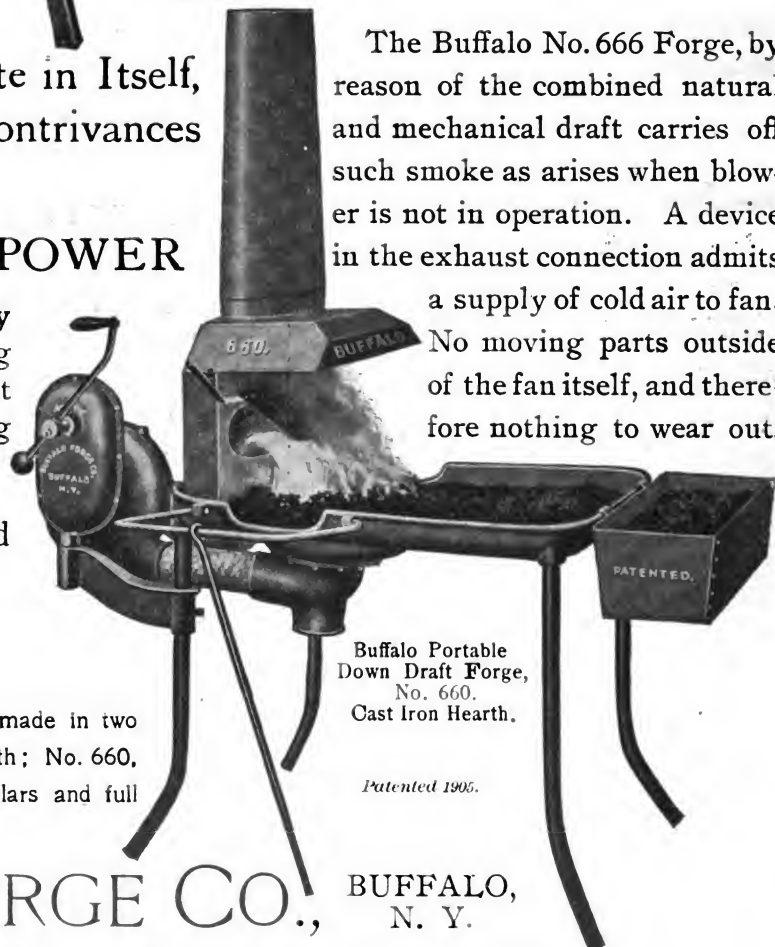
Buffalo Portable Down Draft Forges are made in two styles: No. 666 made with Steel Plate Hearth; No. 660, made with Cast Iron Hearth. Send for circulars and full particulars.

**BUFFALO FORGE CO.,** BUFFALO, N. Y.

THE CANADIAN BUFFALO FORGE CO., Ltd. MONTREAL.



BUFFALO PORTABLE  
DOWN DRAFT FORGE  
No. 666.



Buffalo Portable  
Down Draft Forge,  
No. 660.  
Cast Iron Hearth.

Patented 1905.



**THE "BUSH" Low-down Handy Wagon**

WITH 4-IN. TIRE STEEL WHEELS  
Our wagons are well ironed throughout—wheels made with sound staggered spokes.



We make any size wheels to fit any skein.

We manufacture a complete line of metal wheels for corn planters, cultivators, plows, etc.

WRITE TO **C. BUSH, QUINCY, ILL.**  
(MENTION THIS PAPER.)

**THE GENEVA**

**Handy Farm Wagon**  
THE BEST METAL WHEEL WAGON MADE.



All Goods Guaranteed

Pressed steel wheels, any height and width tire, interchangeable hubs. Gears of selected stock, thoroughly ironed. Made in several styles.

WE ARE ESTABLISHING ONE AGENT IN EVERY TOWN.  
Send for Descriptive Circulars to

**Geneva Metal Wheel Co.**  
GENEVA, OHIO

**BUILT TO STAND the Test of Time.**

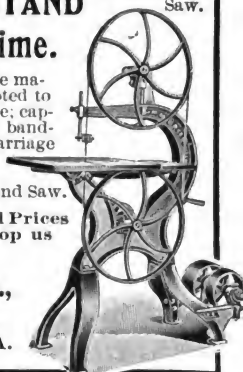
A well-made, accurate machine; especially adapted to run by gasoline engine; capable of all kinds of band-sawing, particularly carriage repair work. These are a few of the fine points of Marston's Band Saw.

We will gladly send Prices and Circulars. Drop us a Card today.

**J. M. Marston & Co.,**

222 Ruggles St.,  
Boston, Mass., U.S.A.

24-Inch Band Saw.

**The MARVEL**

**Combined Punch and Shear.**



Double lever system makes heavy work easy. Cuts and punches iron flat, round and angle. It will pay you to investigate our machine. Write for full particulars, price.

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**DEATH TO HEAVES! NEWTON'S**

Send for Booklet.

\$1.00 per can, of dealers, or express prepaid.

**THE NEWTON REMEDY CO., TOLEDO, OHIO.**

**SPAVINOFF CURES**

Spavin, Ringbone, Grease Heel, Sweeney, Windgall, Enlargements, Curb, Galls, Sores, Pollevis, Scratches, ShoeBolls, &c. Removes unnatural growths and lameness, leaving flesh smooth and clean. Testimonials.

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\$1.00 per Box, by Mail. For HORSES AND CATTLE.

**OUR SPECIAL Ignition Battery**

**THE NO. 16 ACME**

is 8 inches high by 3½ inches in diameter.

On account of its large size and our exceptional care in building it, it develops a current of 22 to 24 amperes.

It has unusually long life and internal action is reduced to a minimum.

You can have no accurate idea of its value in ignition service until you try a few cells.

**QUALITY COUNTS**

The  
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ELECTRIC  
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**HELLER'S CELEBRATED AMERICAN HORSE RASPS, FILES AND FARRIER'S TOOLS**

will save you Time and Money. Their Superior Quality sets a known and tested Standard of Excellence. All made from our own Production of Special Refined Clay Crucible Steel and tempered by a Secret Process. New Catalogue Mailed Free on Application.

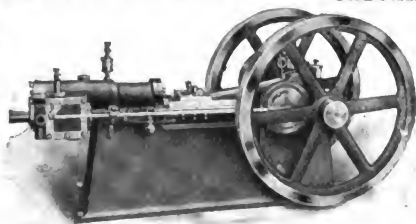


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**HELLER BROTHERS CO., Newark, N. J., U. S. A.**

**THE ROBERTSON Straight-Line GAS AND GASOLINE ENGINES**

A Combination  
of Good Features  
Beauty,  
Excellence  
Reliability  
Durability  
Smooth Running.  
TRIED and TRUE.



See that **CROSS-HEAD** and **SLIDE** making a **STRAIGHT LINE PISTON**. No loss of power. No re-boring of cylinder, adding many years life to engine. All joints on outside, easy of access. Write for our offer, stating size.

Built only by **The Robertson Mfg. Co.** Buffalo N. Y.

**IT'S NO TRICK AT ALL**

To attach a Pioneer Steel Shaft End. Repairs the shaft quickly, without unnecessary labor in fitting and without possibility of getting a joint that isn't a joint. Just butt the shaft up firmly against the interior



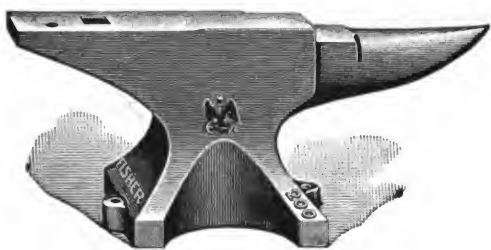
hard wood filler,

and remember that the Pioneer is a double-barreled tube—that it's finished with an enamel that looks like patent leather and that won't come off. Give your trade something that will satisfy them and that you won't need to apologize for—a **PIONEER**, made by

**CRANDAL, STONE & CO. Binghamton, N. Y.**

BE SURE IT'S A PIONEER.

**"EAGLE"**



**ANVILS.**

1843

1906

**We have had over sixty years of Experience in this line and offer you the most reliable Anvils on the Market. Every one Guaranteed.**

The Face Consists of a Single Piece of the Very Best Cast Steel Perfectly Welded and of the Hardest Temper. The Horn is made of Tough Untempered Steel and will neither Break nor Bend.

**All "Eagle" Anvils made with the Latest Fisher Patent Double Thick Steel on Both Edges of the Face. Made in all Shapes and Sizes up to 1300 lbs. Weight.**

WRITE FOR INTERESTING CIRCULARS AND PRICE LIST. SENT FREE.

**EAGLE ANVIL WORKS, TRENTON, NEW JERSEY.**

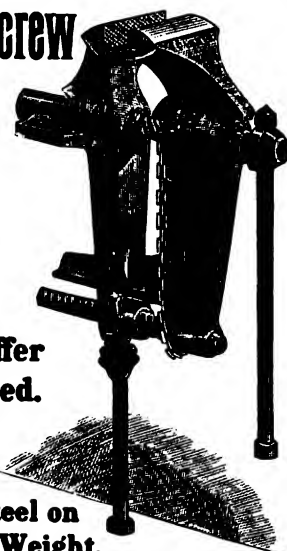
**PIONEERS**

In the Manufacture of

**ANVILS AND VISES OF QUALITY**

**"Fisher" Double Screw Parallel Leg Vise**

Is sold by Reliable Dealers Everywhere. For Strength and Durability there are none better made. The "FISHER" is acknowledged the best for Blacksmiths



## SEARS IMPROVED PUNCH AND SHEARS

Wherewith present to the readers of THE AMERICAN BLACKSMITH our improved Punch and Shears, a machine that we guarantee to be the **most powerful** and **handy** of any punch and shear on earth for jobbing and wagon shops. This machine has no equal, as it has a power of 38 tons on punch with a man weighing 150 pounds on a 4-foot lever. It will punch a  $\frac{3}{8}$  inch hole in  $\frac{1}{2}$  inch iron, will shear iron  $\frac{3}{8}$  by 4 inches wide, and will cut off 1 inch round iron. The above work is done with ease.

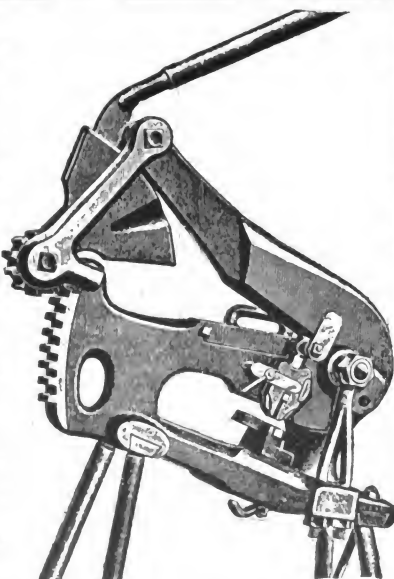
### OUR GUARANTEE

We guarantee our Punch and Shears to do the work as stated above, and will give \$200.00 to anyone who will show a Punch and Shear that will compete with ours in a jobbing or wagon shop.

We are the only firm that advertises the length of lever it requires to do the work of these machines, and would suggest before buying a Punch and Shears to find out the length of lever it requires to do the work advertised.

SEND FOR CIRCULARS AND PRICE LIST

**GEO. SEARS & SON**  
ONSLow, IOWA



THE

## Little Giant

COMBINED

**Punch and Shear.**

**The Most Powerful Lever Punch and Shear Made.**

5 Punches and Dies with Each Machine.

MADE IN THREE SIZES.

No. 1—Will punch  $\frac{3}{8}$  inch hole in  $\frac{1}{2}$  inch iron. Cuts iron  $\frac{3}{8}$  inch thick and 1-inch round. Weight, 515 lbs.

No. 2—Will punch  $\frac{1}{2}$  inch hole in  $\frac{1}{2}$  inch iron. Cuts iron  $\frac{1}{2}$  inch thick and  $\frac{3}{4}$  inch round. Weight, 850 lbs.

No. 3—Will punch  $\frac{3}{4}$  inch hole in  $\frac{3}{4}$  inch iron. Cuts iron  $\frac{3}{4}$  inch thick and  $\frac{3}{4}$  inch round. Weight, 280 lbs.

Only ONE operation of the Lever does the work. No changing required.

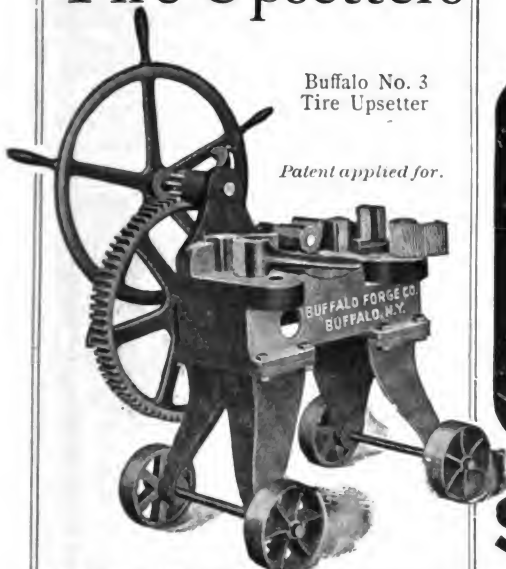
Note the improved Stripper and Hold-down. This machine is made for the blacksmith shop, and we DO claim that it is decidedly the best on the market for that place.

For Sale by your Jobber. If not, Write Us. Send for Circular.

**Little Giant Punch & Shear Co., Sparta, Ill.**



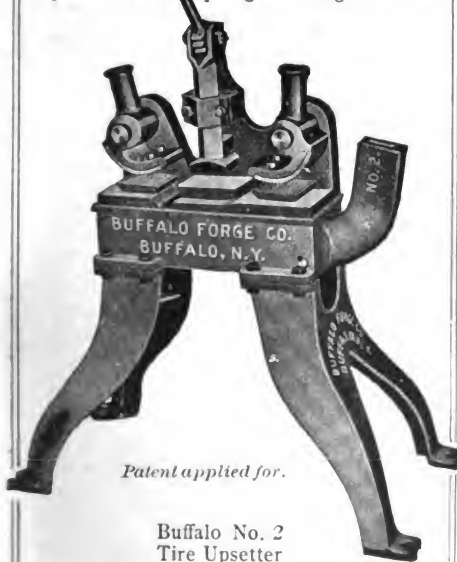
## Buffalo Tire Upsetters



Buffalo No. 3  
Tire Upsetter

Patent applied for.

THIS is a high power machine designed for the heaviest tires. It is of the edge grip type operated by a windlass through reduction gears. Grips have a throw of  $1\frac{3}{4}$  in., which, with the ten to one reduction gears, enable a force of a ton to be brought on the work with less than ten pounds pull on the wheel. Grips are faced with tool steel which is properly cut with full, sharp teeth which will not become battered and lose their holding qualities in service. It has a removable anvil piece same as the No. 2 style and a removable cam in place of the plunger. Weight 900 lbs.



Patent applied for.

Buffalo No. 2  
Tire Upsetter

THIS machine upsets  $3 \times \frac{5}{8}$  tires and axles up to  $1\frac{1}{2}$  in. square. Grips are faced with tool steel with teeth carefully cut and tempered. Lower grips adjust themselves automatically to curvature of tire or for straight work. Upset both straight and curved work. The plunger prevents all buckling or kinking. Weight 275 lbs. Height 22 in. Write for circular.

**BUFFALO FORGE CO.,**  
BUFFALO, N. Y.  
The Canadian Buffalo Forge Co., Montreal.



## HOW TO BUY SOLID BOX VISES

When you buy a Solid Box Vise, why not **PAY** for it according to the **AMOUNT OF WORK** it will **DO** for you?

1. The wider the jaw, the larger the work it will take.
2. The **WIDER** the vise **OPENS**, the larger the work it will hold **SECURELY**.
3. The **HEAVIER** the vise, the **HEAVIER** the work it will **STAND UP UNDER**.

"Columbian" Solid Box Blacksmith's Vises are **STANDARD** in these three respects.

Better still, they are finely finished, and high grade in every particular.

Our Vise and Anvil Catalogue No. 16 gives the size of jaw, the distance vise opens, the weight, etc., of each and every "Columbian" vise, from a 25 to a 200 pounder.

Whether you buy a "Columbian" vise or not, the vise you buy should come up to the dimensions shown in our Vise and Anvil Catalogue No. 16.

Send for it today, and keep it on file.

It will enable you to "get your money's worth" when you are ready to buy. A postal will secure it.

**THE COLUMBIAN HARDWARE CO.**

MANUFACTURERS

CLEVELAND, OHIO, U. S. A.



**LIGHTNING PORTABLE PUNCH NO. 5**

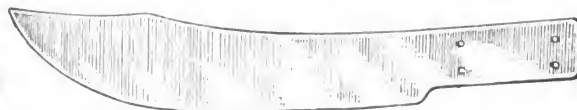
**PATENT LIGHTNING PORTABLE HAND PUNCH.**

Several sizes. Capacity up to  $\frac{1}{4}$  inch plate. Indispensable in any shop.

MADE BY AMERICAN LOCK NUT COMPANY OREGON, ILL.

SEND FOR CATALOGUE AND PRICES.  
AMERICAN LOCK NUT CO., OREGON, ILL.

**HAND  
FORGED**



**BUTCHER  
KNIVES**

**A GOOD  
SIDE-LINE**

Hundreds of blacksmiths are making large profits by selling these blades. Each one is fully warranted. Made of Sanderson Steel. Round or riveted. All sizes from 5 to 8 inch. Handles ready to put on, 1c each.

**\$ .15 EACH  
\$ 1.50 DOZ.**

Hand Forged Razors, ready to use, 40 cents each.  
Pocket Knife Handles in variety, 10 cents each. Send for sample.

**WOODWORTH KNIFE WORKS, NUNDA, NEW YORK**

# DON'T BUY GASOLINE ENGINES

all one-cylinder engines; revolutionizing gas power. Costs Less to Buy and Less to Run. Quickly, easily started. No vibration. Can be mounted on any wagon at small cost—portable, stationary or traction. Mention this paper, SEND FOR CATALOGUE. THE TEMPLE PUMP CO., Mfrs., Meagher & 16th Sts., Chicago. THIS IS OUR FIFTY-SECOND YEAR.

UNTIL YOU INVESTIGATE  
"THE MASTER WORKMAN."

a two-cylinder gasoline engine superior to  
a two-cylinder kerosene engine at small cost—portable, stationary or traction.


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Our 3 books for inventors mailed on receipt of 6 cts. stamps  
R.S. & A.B. LAGEY, Washington, D.C. Estab. 1888.

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Our Customers Say,

"Samples worked fine, send me an Outfit."  
"Much pleased with Braziron"  
"Works all right."  
"Your Braziron is a wonder."  
"More than you claim."  
"Have done a number of jobs with Braziron  
and all were a fine success."  
"Have brazed castings up to 8000 lbs. weight  
with Braziron."  
"Brazed a broken eccentric strap for 60 H. P.  
engine, made a perfect joint."  
You too can increase your business and  
make money with Braziron.  
Send 10 two-cent stamps for trial package of  
Braziron and flux sufficient for several jobs.

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No. 18 W. Randolph St., Chicago, Ill.



**Remington  
Typewriters**

look durable  
and are as  
durable as  
they look.

Remington Typewriter Co.  
327 Broadway,  
New York.

**PATENTS** Promptly Secured.  
Highest references from  
prominent Manufacturers  
Write for Inventors' Hand Book.  
SHEPHERD & PARKER, 850 F St., Washington D. C.

## ECLIPSE GAS AND GASOLINE ENGINES.

Vertical 2, 3, 4, 5, H. P.  
Horizontal 5, 10, 12, 15, 20, 25, H. P.

Designed and Built for BUSINESS.  
Catalogue on request.

**MYRICK MACHINE CO., Olean, N.Y.**

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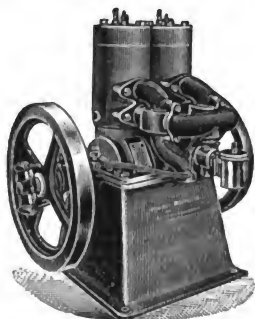


The Goodson Igniter  
is guaranteed to pro-  
duce a sufficient  
spark to start a gas  
or gasoline engine  
without batteries or  
spark coil.

Send for Catalog.

**Goodson Electric  
Ignition Co.**

95 Point Street,  
PROVIDENCE, R. I.



## The Maxwell & Fitch Gasoline Engine

Two cycle, a power impulse every revolution, we use no gears, cams, cam shafts, valves or valve springs, no engine can be simpler or more durable. If you want a well built engine, one built of the best materials, then just send us a postal for our catalogue and price list.

**THE MAXWELL & FITCH CO.**  
ROME, N. Y.



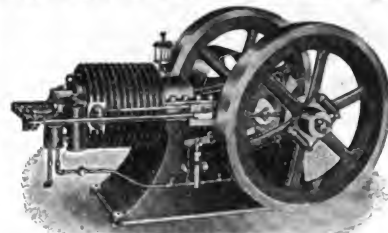
## MIETZ & WEISS KEROSENE ENGINES

GAS AND OIL, 1½ to 70 H. P.  
Safe, Reliable, Economical.  
Send for Catalogue.

**A. MIETZ.**

128-138 Mott St., New York.

## The GADE Air Cooled Gasoline Engines



Made in 2, 3 and 6 horse power sizes. What's the use of paying good money for an old style engine, when you can get something better in the "Gade Air Cooled" at the same cost. Buy one. It will not freeze up or go back on you in cold weather. It's ready for business all the time. We know it will please. By all means write for descriptive circulars and price list of the "Gade." Address, **GADE MFG. CO., Iowa Falls, Iowa.**

## Why Not Stop Your Troubles?

"A Wizard  
Tubular"  
Does It.



Armature incased in WATER-PROOF non-corroding brass tube. All brass screws. Friction, Belt or Governor drive. Brush-holders removed without loosening screws. All parts polished brass. Contact and Jump Spark.

A TRIAL WILL CONVINCE YOU.  
Most popular and satisfactory Magneto on the market.  
Price as popular as Machine.

GOVERNOR DOES AWAY WITH BATTERIES AND SWITCHES.

**HERCULES ELECTRIC & MFG. CO.**  
INDIANAPOLIS, INDIANA.

Write for catalogue and SPECIAL OFFER.



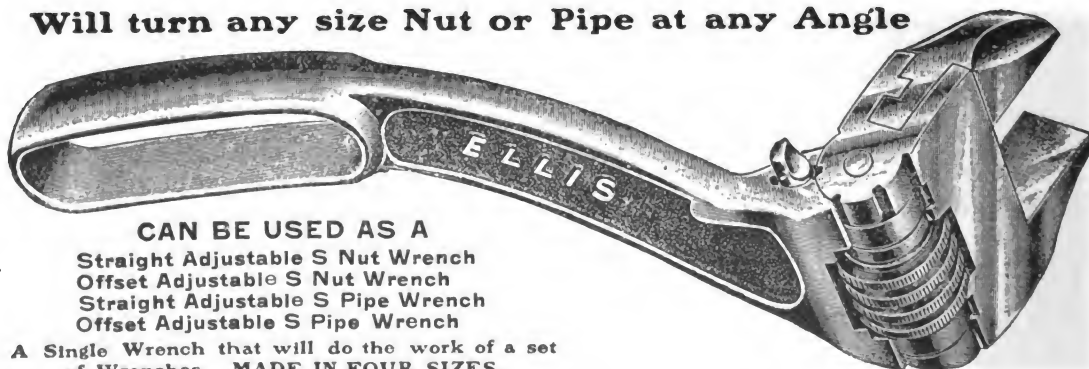
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If so, *The Practical Gas Engineer* will tell you how to get the best results from it. A plainly written book telling how to erect, operate and care for gas and gasoline engines. Cloth bound, 152 pages. Sent prepaid, for \$1.00.

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## The 4 in 1 Ellis Wrench

Will turn any size Nut or Pipe at any Angle



CAN BE USED AS A

Straight Adjustable S Nut Wrench  
Offset Adjustable S Nut Wrench  
Straight Adjustable S Pipe Wrench  
Offset Adjustable S Pipe Wrench

A Single Wrench that will do the work of a set  
of Wrenches. MADE IN FOUR SIZES.

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Write for Catalogue  
No. 39  
Blacksmith's  
Tools.





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For Vehicles of all kinds with STEEL OR RUBBER TIRE.  
Have a record of excellency for seventeen years. **• • •**

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Are used by some of the largest locomotive and engine builders in the U. S. They have been found to be superior in finish and quality. We sell genuine Cold Punched Nuts made from our own brand of iron for this use. With our special process we have been turning out an article that has gained a reputation, and now "Milton" Nuts are specified exclusively by some of the largest users. Having exceptional shipping facilities it will pay you to send us your next specifications.



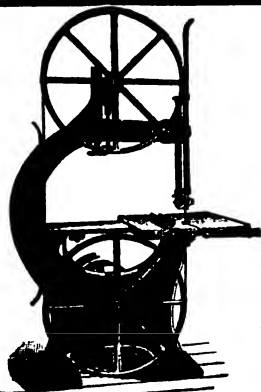
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We also make Hot Pressed Nuts, Washers, Refined Bar Iron, etc.

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Every gas engine owner should have an **APPLE AUTOMATIC SPARKER**. No Switches, No Belts, No Batteries. Delivers a sure, steady current at all times. Don't be at the mercy of a 40-cent door-bell battery, but get an Apple Automatic Sparker and be independent. For full information write

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Wood Working Machines in your Shop will enable you to do better work and more of it than you can do with hand tools.

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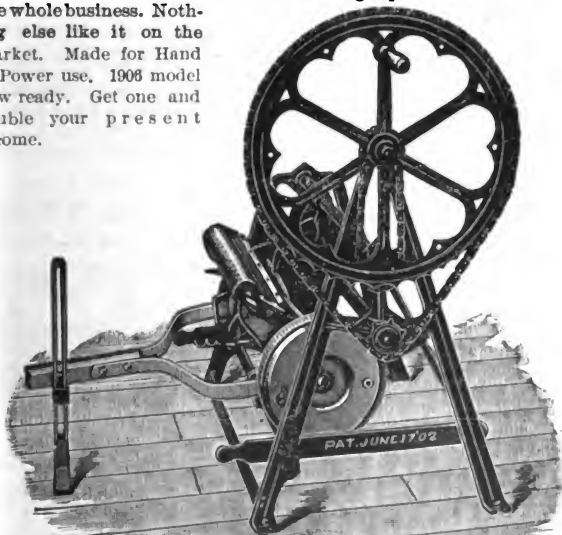
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Will enable you to grind any lawn mower with absolute accuracy in less than fifteen minutes, without taking apart. Revolutionizes the whole business. Nothing else like it on the market. Made for Hand or Power use. 1906 model now ready. Get one and double your present income.



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Manufacturers of

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**BORAX-ETTE** makes steel weld easily. It does not have to be applied between the laps like other compounds, but is used the same as borax. It has no equal for all kinds of steel welding.

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STANDS FOR  
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SIMPLICITY  
DURABILITY  
EFFICIENCY  
RELIABILITY  
ECONOMY  
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The Trlitt  
Electric Company. UNION CITY,  
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Patented February 7, 1900. The up-to-date machine for brazing agricultural implements, automobiles, bicycles, etc. Will do all kinds of brazing, both light and heavy. It is fitted with three powerful improved Hydro Carbon Burners. Both Gasoline and Kerosene Machines in stock. Write for description.

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That will fit the spindle of your drill press, holding drills  $\frac{1}{2}$  to  $\frac{3}{4}$  in. inclusive, with reducer to  $\frac{1}{4}$  in. Drills held by this chuck are much cheaper than drills with  $\frac{1}{4}$  in. or  $\frac{3}{4}$  in. shank. Simplest and cheapest chuck on the market.

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Direct connected, has been designed especially for the blacksmith, and it is his ever-ready helper that works for less than five cents a day, and never tires. It places him on an equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.

NEW ERA ELECTRIC CO.



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W. Lake St.  
CHICAGO.

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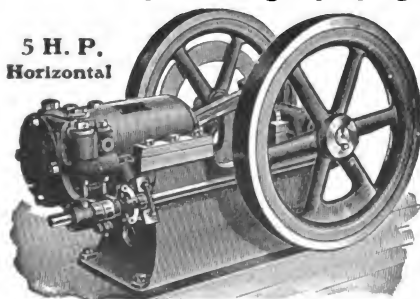
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and win the farm wagon business\* It has time, labor and storage saving features, which please the farmer. No special wood materials required. We give shop and county rights free of charge. Our circular shows how to build this improved farm box. Write today.

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5 H. P.  
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Sizes, 1½, 3, 4½ H. P. Vertical.  
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Either tube igniter or electric igniter. Shipped mounted on skids, if desired for farm use.

Also equipped with pumping attachments. Write for booklet describing full line New Era Gas Engines from 5 to 100 H. P. Special inducements to dealers as agents.

THE NEW ERA GAS ENGINE CO.  
No. 63 Dale Ave., DAYTON, OHIO.



3 H. P.  
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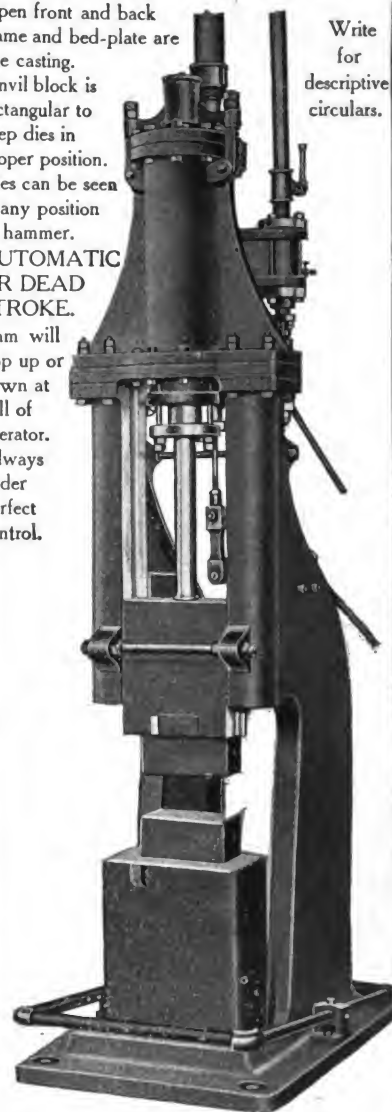
All Modern Improvements.  
SUPERIOR TO ALL OTHER MAKES.

Open front and back frame and bed-plate are one casting. Anvil block is rectangular to keep dies in proper position. Dies can be seen at any position at hammer.

AUTOMATIC OR DEAD STROKE.

Ram will stop up or down at will of operator. Always under perfect control.

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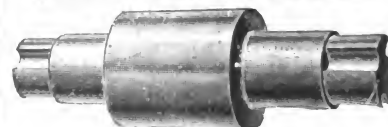


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## SOLID STEEL SHEAR KNIVES

ROTARY, STRAIGHT OR ANGLE.  
ROLL TURNING TOOLS  
ANY SIZE OR SHAPE.

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Hardened Forged Steel Rolls  
for Cold Rolling and  
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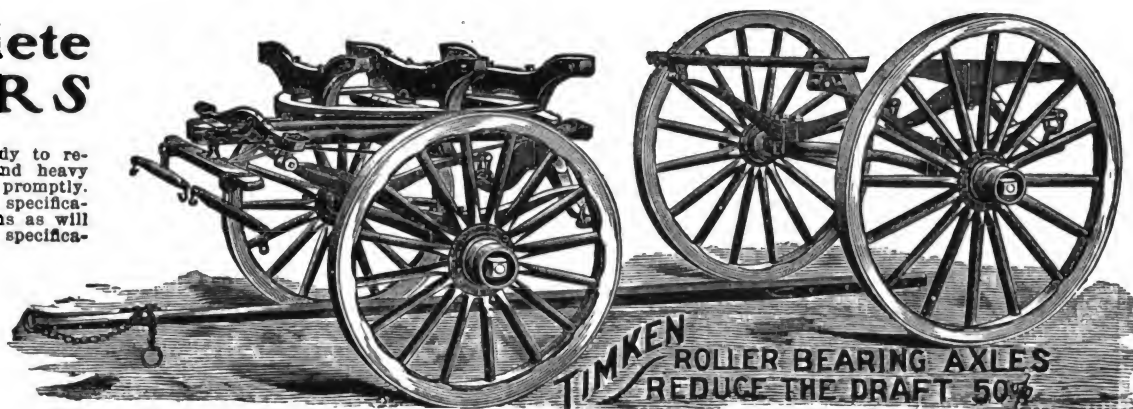
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SAMUEL TRETHEWEY & CO.,  
Forty-Seventh St., PITTSBURGH, PA.

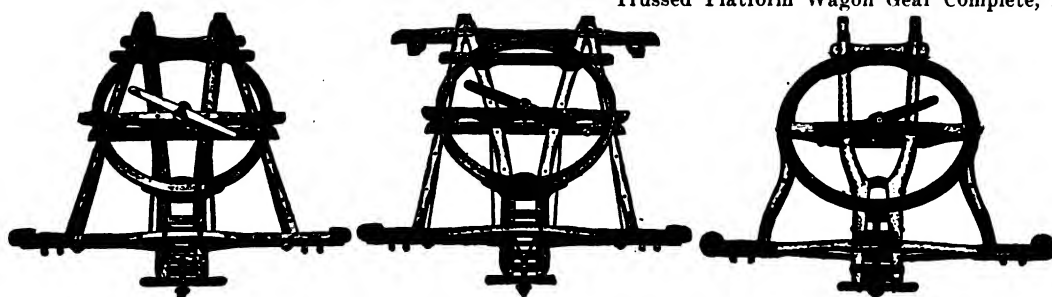
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As shown herewith, ready to receive body, for light and heavy work, can be furnished promptly. In ordering, give full specifications, or such descriptions as will enable us to make up specifications.

Also Combination and Three-Spring Gears in several styles.



Trussed Platform Wagon Gear Complete, Ready for Body.



1,000 Styles and Sizes

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Write for Catalogue A

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Steel Letters and Figures  
**BURNING BRANDS**  
Stencil Dies, Stencils, etc.

Geo. M. Ness, Jr.,  
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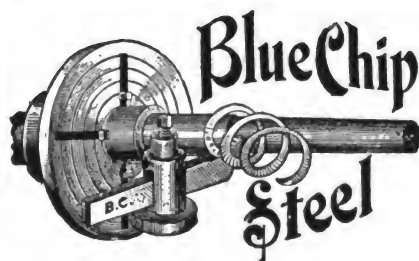
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Will turn off blue chips  
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**Firth-Sterling Steel Co.  
PITTSBURGH.**

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### CASH Always Secures BARGAINS and ALWAYS WILL

Special Net Price on Sarven Patent Wheels  
(C. B. soc. extra) with steel and rubber tire

Size of tread	Price per set for wheels with flat steel tire on and hubs bored	Price per set for wheels complete with channel and rubber tire on, and hubs bored	Add to price of wheels for axles and boxes set
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Included angle of cutting point is Counterbores with other angles made to order at special prices.

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M. T. D. & M. Co. Tools are first class in every respect, both as to quality and workmanship and the fact that they have been sold for many years and in increasing numbers in England, Germany and other European countries is evidence that M. T. D. & M. Co. goods are competitive.



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2 to 25 Horse Power

Always Ready to Start

No Engineer Required

No Increase in Insurance by their Use

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4 H. P. Engine

The Best on the Market  
for the user of small  
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## WE INVITE INSPECTION And CHALLENGE COMPETITION

WILLIAMSPORT ENGINES are constructed by the most skilled workmen, and only the very best material used. We offer you an Engine of the Finest Quality, noted for its Simplicity, Durability, Ease of Operation and Beauty of Design. Our broad Guarantee covers all.

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### OUR GUARANTEE.

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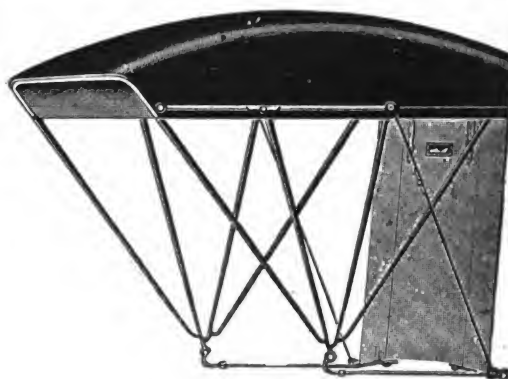
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True economy in business means the selling of such goods, which of themselves give satisfaction, and cause the purchaser to rely upon any statement you may make regarding your entire line.

### SHELTER TOPS

have the reputation, and will bear out any statement you may make concerning them. They are built by careful mechanics, of the best material, and are sure to give the best of satisfaction. We also make a complete line of Spring Wagon Tops, Sun Shades, Storm Aprons, Cushions, etc.

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ANGLES, BARS, PLATES, SHEETS, RIVETS, PIPE,  
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Kept in stock at Cleveland for immediate shipment,  
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**IRON, STEEL  
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**The 1902 CHICAGO CLIPPER****Price, \$10.75**

"Stewart's Patent" is recognized as the Greatest Clipping Machine ever invented.

More of them are sold every day ten times over than all other makes combined. Each one is sold under a positive guarantee to clip faster and turn easier than any other machine made, regardless of price, or money refunded. All gearing is cut from solid metal, and unlike any other machine made, it can be turned with either the right or left hand.

**IT'S EASY MONEY**

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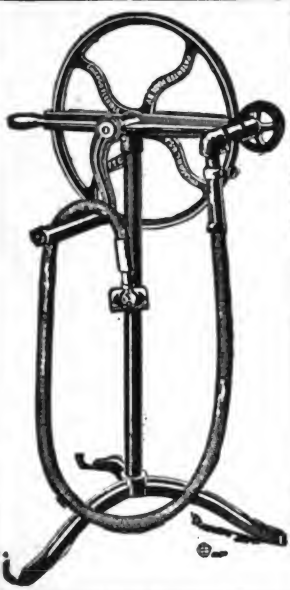
Send \$3.00 and machine will be sent C. O. D. for the balance.

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Would you be interested in learning how to pick up a good many extra dollars in your business with very little extra work? Would you like to increase your business—make it bigger—make more money and make more satisfied customers? You can do it and do it easily with

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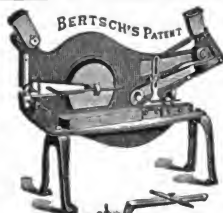
Hundreds of blacksmiths are doing it today and so can you. We want you to sell and recommend O. K. Hoof Remedy to your trade, and this is how we suggest you do it: First, we want you to test it. We want you to KNOW from actual experience what it will do so that you will have confidence in it—so that you will be enthusiastic over its merit. We will stand the risk if it does not do what we claim for it. For example, we offer \$100.00 for any case of Contracted Feet, Corns, Dry, Cracked, Brittle Hoofs, Scratches, Sores, Thrush and Quarter Cracks it fails to cure except in founder when used as directed. We do more—we say to you, and you can say to your customers, back goes your money if it fails. You take no risk. Send 15c for trial can and get our special liberal terms to blacksmiths. We want you to handle this remedy in your locality. You can sell lots of it and make money. Send today and "clinch" the agency.

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CHICAGO**O.K. HOOF REMEDY  
KEEPS HOOFS O.K.****Lathes and Drill Presses**

Especially for Blacksmiths and Machinists, also Hand and Power Planers and Shapers and Machinists' Supplies.

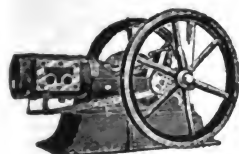
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PUNCHES**

Hand or power, for shearing and punching plates, bars and angles. Send for Catalogue C.

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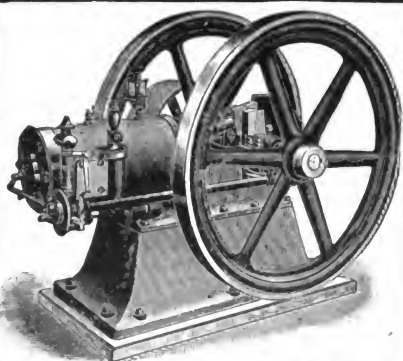
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SIMPLEST  
Engine Built****The DAVIS Engine**

Combines all Modern Improvements. The Safest, most Economical and most Reliable Power for the Shop Owner.

Davis Engines are in use every day in thirty-four states and territories in the United States, in six provinces in Canada and British America, and in many States in Old Mexico.

Drop us a postal card and we will send you free a beautiful illustrated catalogue with a full description of our Engine. Our prices will interest you. Write today.

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**HIGHEST AWARD--GOLD MEDAL**

ST. LOUIS EXPOSITION

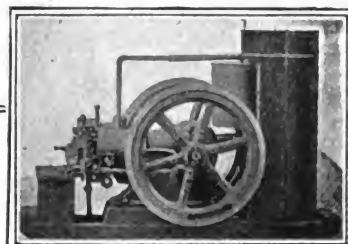
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**Efficiency  
Durability  
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Write for Catalogue and Prices.

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**Designed for the Our 4 H.P. Engine**

Fills every shop requirement and is always ready for business. Giving perfect satisfaction to hundreds of shop owners. Simple, strong, substantial. Best material and finest workmanship. Write for our Catalogue. Sent free for the asking. **ROCKFORD ENGINE WORKS, Rockford, Ill.**

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FOR

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**L. S. Starrett says:**

"If you find any better tools than Starrett Tools—buy them."

**HACK SAWS****STARRETT QUALITY.**

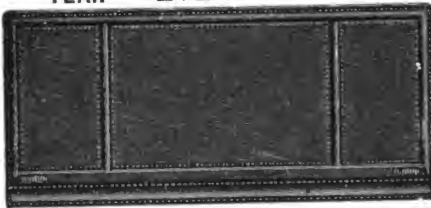
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WEAR AND  
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PROVE  
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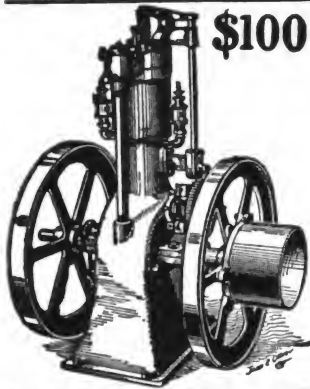


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FINISH EQUAL TO BEST PATENT  
LEATHER, BUT MORE DURABLE

For Sale by your Jobber. If not,  
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It will develop more power on less fuel  
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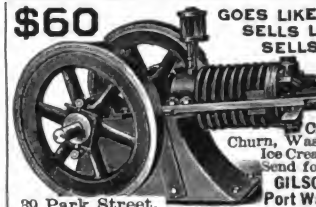
Built on modern lines and up to the very latest practice; made from the best material, and with ordinary care will last a life-time.  
We have been building Gasoline Motors for over twenty years. More than 12,000 PIERCE MOTORS are in use in all parts of the world. We know how to, and do, build them right, in fact, we

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If they do not, send them back and we  
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The PIERCE MOTORS are the best in the world and cost less than the poorest. We guarantee them against defective material for life. If you want power for any purpose, write for our printed matter, stating your needs. We also build other sizes up to 100 H. P., also Marine Motors, Launches and Auto Boats. Be sure and address

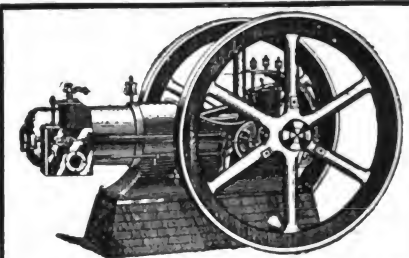
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3 1-2 Actual Horse Power.

**\$60**



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SELLS LIKE SIXTY  
SELLS FOR SIXTY  
**GASOLINE  
ENGINES**  
for Pumping,  
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## THE SINNING GAS ENGINE

Is the simplest, most durable,  
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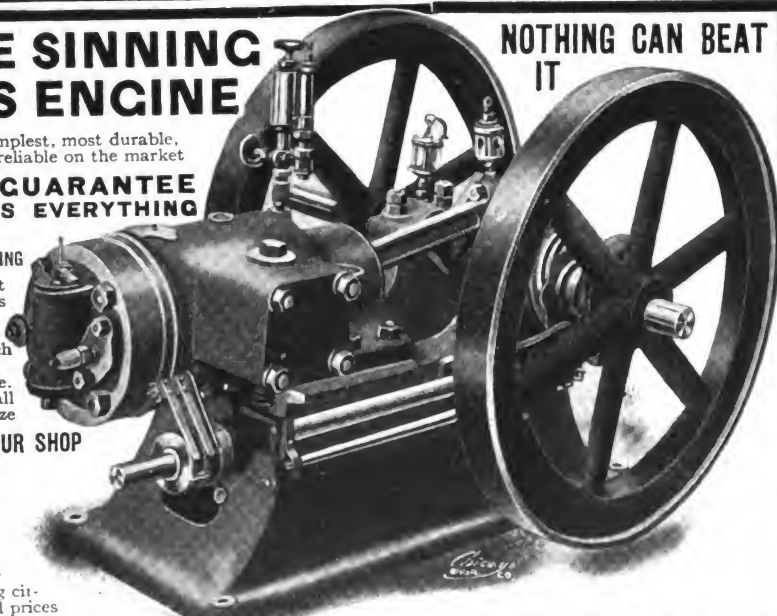
**OUR GUARANTEE  
COVERS EVERYTHING**

### THE SINNING

is cheapest  
to run, has  
few working  
parts, all of  
which are  
inter-  
changeable.  
Bearings all  
hard bronze

**EQUIP YOUR SHOP  
with the  
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Write for  
interesting cir-  
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NOTHING CAN BEAT  
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**THE CHARLES SINNING MACHINE WORKS** 242 DICKSON STREET  
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## A TURN FOR THE BEST

Every dealer turns profits his way when he  
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### EUREKA VEHICLES

Everything that goes into them is the best we  
can buy or make. This means that your custom-  
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compliments instead of complaints.

Easy to sell because quality is high and prices are low.  
Profitable because quickly sold on liberal margin.

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Wheels in the white or finished complete,  
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Buggy Tops in all sizes, grades and prices.

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Harness Co.,  
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Address H. A. BEHAN, Manager.

## ONLY ONE TO A CUSTOMER

AT THIS SPECIAL LOW SAMPLE ORDER PRICE



**\$50.00** buys a RUBBER TIRED BUGGY. Fine  
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RUBBER TIRED RUNABOUT for only  
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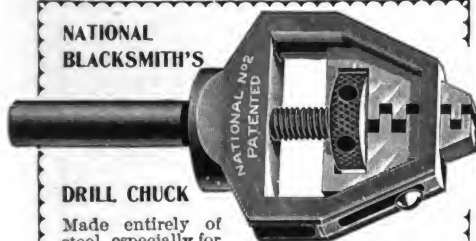
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## DRILL CHUCK

Made entirely of steel, especially for blacksmithing and carriage work. Positive, strong and self-cleaning. Casts no shadows. Will save cost over other chucks in the saving of time. Money refunded if not as represented. Ask your jobber for it or send direct for prices and circulars. The best is the cheapest.

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— MANUFACTURERS OF —

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TIRED  
TOP  
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\$27.50BUGGY  
TOPS,  
\$4.50

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BUOB & SCHEU, 1883 500-500 EAST COURT ST. CINCINNATI, OHIO.

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**Pulley Breaking**  
**Bridle** you can make the most restless horse stand as quiet as a lamb—even ugly horses, stallions, etc., completely subdued while being shod. Price, Only 60c postpaid. You should own one.

Will bring business to you. Send for circular telling all about it.  
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## EMERY WHEELS CUT QUICK

A wheel that will do the work in one-fourth to one-half less time is by far the cheapest in the long run. A wheel that will save only one hour per day during your busy season would pay for itself in full.



# "CHICAGO"

WHEELS SAVE TIME

They're made  
of stuff that cuts

Emery Wheels, Glue, Emery, Pol-  
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136 Page Catalogue for the Asking

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Can't be excelled for durability. "Hand Punched."



Our new 18 inch rasp. Round ends.  
Ask your dealer for the Westfahl brand. If he can't supply you write us your requirements  
Mention The American Blacksmith,  
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Simple, accurate and durable. Your equipment not complete without one. Give this Gauge close examination. Best material and workmanship guaranteed. Beam is the very best tubing; one inch in diameter, six feet long. Pivot arm, gauge plate and indicator all of solid brass. Self adjustable to any length or size of axle.

This Superior gauge is sold by dealers everywhere and always gives perfect satisfaction.

If your dealer cannot supply you write to us for our liberal thirty day free trial offer.

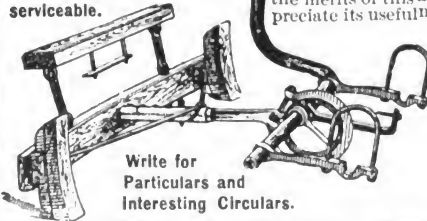
The exact amount of set or gather of the axle is registered automatically in inch measure. You should have one of them in your shop. Write today for interesting descriptive circulars, sent free upon request. Drop us a postal for them.

E. T. BUHL MFG. CO., CLEVELAND, OHIO, DEPARTMENT A.

## KELLER ECCENTRIC BRAKE

Warranted to lock wheels with three ton load with ease; can be applied to any wagon. Works without aid of ratchet. Made in two sizes.

Note its construc-  
tion, sturdy and  
serviceable.



Write for  
Particulars and  
Interesting Circulars.

Blacksmiths, wagon and buggy re-  
pairers especially, will see at a glance  
the merits of this axle cutter and ap-  
preciate its usefulness.

It will cut a pipe, boiler tube  
or shaft, as little or as much as  
desired and do its work ac-  
curately, taking the merest shav-  
ing from the end or cut in two  
at any point, its bearings being  
all on one side of the knife.  
Attractive propositions offered  
to live agents.



Rod,  
Pipe and  
Axle  
Cutter

Write  
for  
details

Keller Mfg. Co., SAUK CENTRE,  
MINNESOTA.

## AIR CUSHION RUBBER HORSESHOE PADS



## See That Cushion?

It fills with air at each step. That's what  
breaks concussion. That's what pre-  
vents slipping. That's what keeps the  
foot healthy. That's what cures lameness.

Twelve Different Styles

Heavy  
Leather Back

NO  
LAMENESS  
NO  
SLIPPING  
CHEAPEST  
AND  
BEST

Medium  
Canvas Back

REVERE RUBBER CO.

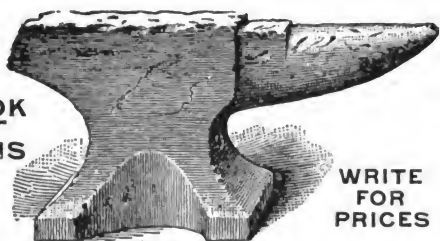
Sole Manufacturers

BOSTON, MASS.



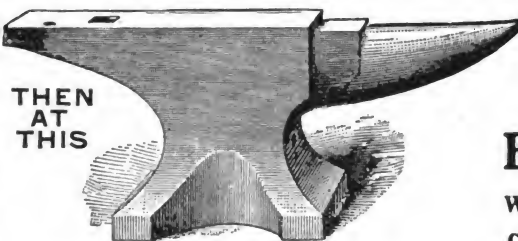
**NO MATTER HOW BADLY THEY ARE BROKEN WE CAN REPAIR THEM IN GOOD SHAPE**

LOOK  
AT  
THIS



WRITE  
FOR  
PRICES

THEN  
AT  
THIS



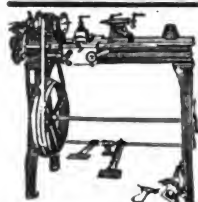
**Columbus  
Anvil and  
Forging Co.,**

West Frankfort St.,  
COLUMBUS, OHIO.

**WE ARE EXPERTS AT REPAIRING OLD WROUGHT ANVILS.**  
WE ALSO MANUFACTURE THE CELEBRATED ARM AND HAMMER BRAND ANVIL. **ASK YOUR DEALER FOR THEM.**

## HONEST DEALINGS

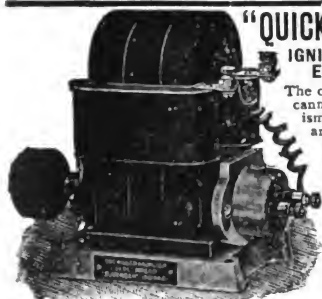
Before an advertisement is accepted for this journal, careful inquiry is made concerning the standing of the house signing it. Our readers are our friends and their interest will be protected. As a constant example of our good faith in AMERICAN BLACKSMITH advertisers, we will make good to subscribers loss sustained from any who prove to be deliberate swindlers. We must be notified within a month of the transaction giving rise to complaint. This does not mean that we will concern ourselves with the settlement of petty misunderstandings between subscribers and advertisers, nor will we be responsible for losses of honorable bankrupts.



### FOOT AND POWER LATHES 9 TO 15 IN. SWING.

We also make Wood Lathes from 6 in. to 14 in. swing. If you are in the market for any tools, our catalog will be mailed free to any address. Shall we mail you one?

**Carroll-Jamelson Machine  
Tool Co.  
Batavia, Ohio.**



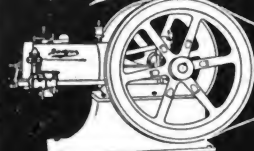
### "QUICK ACTION"

#### IGNITING DYNAMOS Excel All Others!

The only generator that cannot lose its magnetism. For either make and break, or jump spark work. Also spark coils. Send for Catalogue B.

**The  
Knoblock-  
Heideman  
Mfg. Co.,  
SOUTH BEND,  
IND.**

*Badger*



"The world's standard for efficiency"

### BADGER GASOLINE ENGINES Turn Time Into Money

Badger Engines enable the blacksmith to make the most money out of his time by enabling him to do more, better and a greater variety of work, and at the same time employ less help—saving cost of helpers.

The "Badger" stands for superior excellence and efficiency the world over.

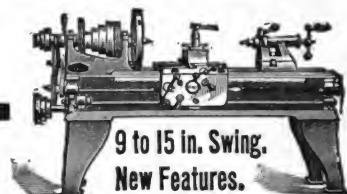
Badger Engines are easy to start and to keep going; cost almost nothing for repairs and last a life-time. They are as cheap as is consistent with best skilled workmanship.

Send at once for our Fine Book, Illustrated in colors—It's FREE. It tells all about Badger Gasoline Engines, and why they are the best on earth for the Blacksmith. Write today, before the books are gone.

Special discount to Blacksmiths who take an agency.  
Write for attractive terms.

**C. P. & J. LAUNON,**  
103 W. Water St., Milwaukee, Wis.

Ⓢ3



9 to 15 in. Swing.  
New Features.

**SEBASTIAN LATHES are Good Lathes**  
Catalogue Free. Sizes 9, 10, 13, 15 Inches.

Our engine lathes are provided with both screw and rod feeds as well as power cross feed. Gears to cut all standard threads from 5 to 36 are furnished. Steady and follower rests, large and small face plates and countershaft go with each Lathe. Foot Lathes, Tools and Supplies.

**SEBASTIAN LATHE CO.**  
124-126 Culvert Street, CINCINNATI, OHIO.

TIRE SHRINKER.



TIRE BENDER



FOR  
PROGRESSIVE  
BLACKSMITHS

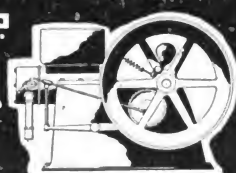
**IDEAL**

WRITE FOR DESCRIPTIVE  
CIRCULARS  
**THE WEYBURN CO.**  
ROCKFORD, ILL. U. S. A.



PLOW SHARE AND OTHER STEEL SHAPES. BLAKESLEY TUVREY IRON.

5 H.P.



\$162<sup>50</sup>

Please send description of your 5 H. P., 1906 Special Gasoline Engine. Also liberal offer, to

**FROM FACTORY TO USER**

**WE SAVE YOU AGENTS' & DEALERS' PROFITS.**

THIS ENGINE IS NOT A TOY, BUT IS LARGE ENOUGH TO SHELL CORN, GRIND FEED, SAW WOOD AS WELL AS PUMP WATER.

FULLY GUARANTEED.

ABOVE PRICE INCLUDES ENGINE COMPLETE READY TO RUN

Cut out this entire ad., write your name and address plainly and mail to

**SPADE ENGINE CO.,**  
VICKSBURG, MICH.

## THE WATERLOO BOY

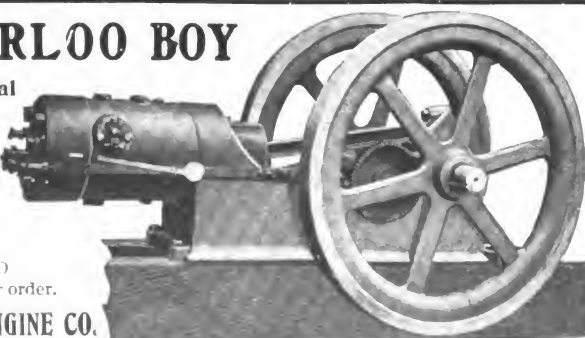
Our Blacksmith's Special  
3½ to 4 H. P.

### GASOLINE ENGINE

The Engine Is Right!  
The Price Is Right!

Investigate the WATERLOO  
before placing your order.

**WATERLOO GASOLINE ENGINE CO.**  
WATERLOO, IOWA



Weight 800 lbs.

**Mr. Blacksmith:**

Here is a Punch and Shear that will punch and shear just as we say with

**ONE MAN ON LEVER.**

Punch 5/8 in. hole in 1/2 in. Iron

Shear 4 x 1/2 in. Flat Iron

7 x 1/4 in. Band Iron

1 in. Round Iron.

Write for Prices, Etc.

**Rock River Machine Co.,**  
JANESVILLE, WIS. U. S. A.





No. 8 REGULAR HEAD.—Exact size.

**"BRIGHTON" HORSE NAILS**

The letter "B" appears on the head of each nail.



No. 8 CITY HEAD.—Exact size.

The **EQUAL** of ANY Nail except  
**"NEW STANDARD."**

**DEALERS' NET PRICES TO SHOERS.**

No.....	5	6	7	8	9	10	11	12
Box.....	\$3.25	3.00	2.85	2.75	2.70	2.65	2.65	2.65
Lb.....	.13	.12	.11½	.11	.11	.11	.11	.11

FOR SALE BY ALL DEALERS.

**TRY A FEW OF THEM**

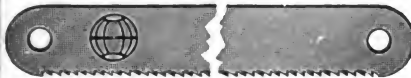
and be convinced of above statement.

Manufactured by

**STANDARD HORSE NAIL CO.,** New Brighton, Pa.

**Your Hack Saw Troubles**

will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



**West Haven Manufacturing Co.**  
NEW HAVEN, CONN.

**NATIONAL SELF-OILING STEEL TUBULAR AXLES**

Now made  
of high  
carbon steel.



Guaranteed to be stronger and more rigid than solid steel axles. We make both. Write us

**National Tubular Axle Co.,** EMIGSVILLE, PA.



**ATTENTION!**

We want you to represent us in your locality selling

**The Victory Corn  
and Feed Mills.**

Oldest and Best Grinding Mill Made. **STRONG, SIMPLE, DURABLE.** Especially adapted to grinding ear corn, shelled corn, wheat, oats, rye, etc. Write for Prices and Particulars today.

**THOMAS ROBERTS,**  
(Established 1876.) **Springfield, Ohio.**

**ELECTRIC FORGE BLOWERS**

**EXCEL ALL OTHERS**

A GOOD  
BLOWER  
THAT  
BLOWS  
EVERY  
BODY  
GOOD



Write  
for  
Prices  
and  
Circulars

MODERN MACHINERY  
MAKES THE SMITH'S  
WORK  
LIGHTER

**ROTH BROS. & CO.**

27-29 So. Clinton Street,  
CHICAGO, ILL.

**RICH'S NEW**

**ARTISTIC  
HORSESHOEING**



**MY LATEST BOOK  
ARTISTIC HORSESHOEING**

SHOULD BE IN EVERY UP-TO-DATE SHOP.

**THE PROGRESSIVE SMITH**

will find it invaluable in his every day work. A practical, scientific treatise on improved methods of shoeing. Special directions given for correcting faulty action in trotters and for shaping shoes to cure different foot diseases. 284 different styles of shoes illustrated and explained. **Cloth bound, 217 pages, Price \$2.00.**

—AGENTS WANTED.—

**Prof. GEORGE E. RICH, 239 S. Main St., AKRON, OHIO.**

**CARPENTER'S NEW  
FULL MOUNTED DIE SETS**

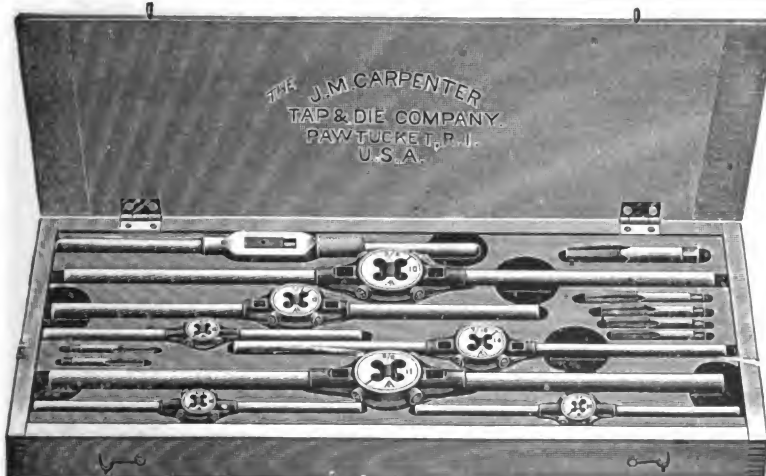
With a stock for each die and the Original Nichols Tap Wrench.

Before buying a die set you should see **Carpenter's** and you will have no other make.

Send for catalogue

**The J. M. Carpenter Tap & Die Co.**

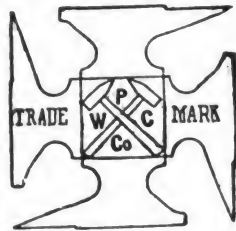
Pawtucket, R. I., U. S. A.



**YOU WILL NEVER FAIL**

To Make a Strong, Clean Weld If You  
Use Perfection Welding Compound.

We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



Perfection Welding Compound will do the trick quickly and neatly. It makes a stronger weld than any other compound manufactured, as proven by the tests it has undergone. Send for free sample.

PRICE CONSISTENT WITH QUALITY.

PERFECTION WELDING COMPOUND CO., SCRANTON, PA.

**DOES IT PAY**

TO STOCK UP WITH  
LOW PRICED TOOLS?

**STERLING HACK SAW BLADES**

ARE NOT THE LOWEST IN PRICE BUT THEY ARE  
**THE CHEAPEST** FOR YOU FOR YOUR CUSTOMERS.

**BECAUSE**, MADE FROM THE HIGHEST GRADE OF STEEL THAT MONEY CAN BUY. MADE WIDE AND HEAVY. *There's a purpose in this.* *It costs us money.* COSTS YOU NO MORE THAN LIGHTER THINNER BLADES.

DIAMOND SAW & STAMPING WORKS,  
BUFFALO, N.Y. U.S.A.

PLATTSBURGH, N. Y., Feb. 20, 1906.

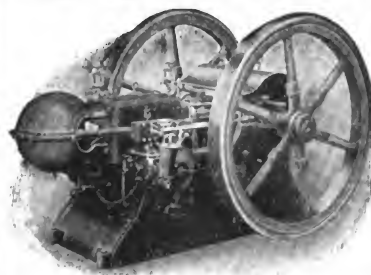
The Buffalo Forge Co.,  
Buffalo, N. Y.

Gentlemen:

We have had in our shop for about 30 days one of your No. 4 B. Combined punch and shear and find after using it to its fullest capacity that it does all the work you guarantee it for. If anyone contemplates buying a punch and shear we would advise them to buy an Armor Plate machine as there is nothing about it that can break, as every part of the machine is made of steel. You may publish this letter if you wish or think it is of any use to you.

Yours truly,

Barnard & Coulbron.

**LIGHTNING BALANCED**

**GAS and GASOLINE ENGINES**

Are Especially  
Suited for  
Blacksmith Shop  
Power.

Write for Free Catalogue.

**KANSAS CITY HAY PRESS CO.,**

482 Mill Street,

KANSAS CITY, MO.

**INVESTIGATE THE****Hercules Hydraulic**

Before  
You  
Buy a  
Tire Setter



**National Machine Co.**  
KEOKUK, IA.

**Henderson Hand Power TIRE SETTERS**

Set Tires Cold.  
Keep the Dish right  
Tighten Wood Work  
Pull Broken Spokes  
Jump in New Spokes  
Are Money Makers



**Standard Tire Setter Co.**  
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**HAY-BUDDEN SOLID WROUGHT ANVILS**

The Gold Medal Anvil  
Highest Award

OMAHA, 1898 PAN-AMERICAN, 1901

Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS.



OVER 100,000 IN USE  
WARRANTED

Experience has proved their worth and demonstrated that "HAY-BUDDEN" Anvils are Superior in Quality, Form and Finish to any on the Market.

**HAY-BUDDEN MFG. CO., BROOKLYN, N. Y.**

# AMERICAN BLACKSMITH

BUFFALO  
N.Y. U.S.A.

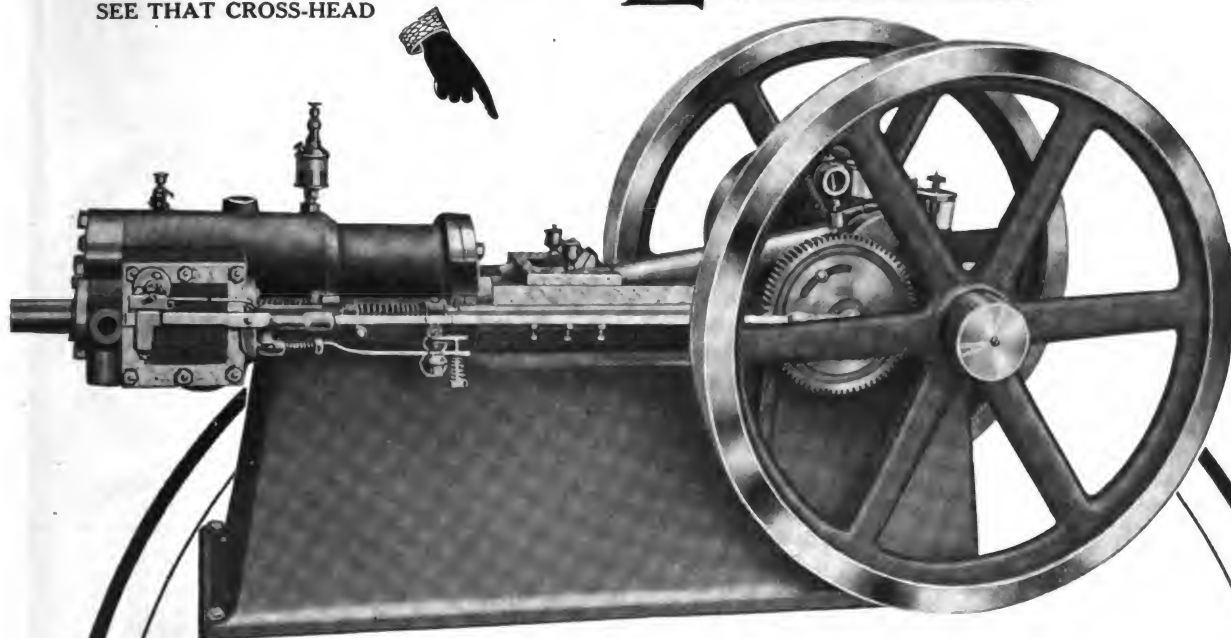
A Practical Journal of Blacksmithing and Wagonmaking

APRIL, 1906

\$1.00 A YEAR  
10¢ A COPY

## ROBERTSON AUTOMATIC GAS AND GASOLINE STRAIGHT LINE ENGINES

SEE THAT CROSS-HEAD



### ROBERTSON ENGINES ARE THE LEADERS

They are the simplest in construction, Most handsome in design. No working joints on the inside. No loss of compression. **Electric ignition** the best yet. **Material the best** throughout. **Crank Shaft** forged from the solid bar, also valves forged in the solid steel. Piston Rings and Cylinders are made from a special close fine-grained metal. Cylinders and valve case water jacketed with provision for no freezing. In operation they are economical. Full power and smooth running. Easy to start, Automatic Governor. In short they are **The Engines**. No Blacksmith or Carriage Maker can afford to install an engine without investigating our proposition. Let us tell you about it. The engine is attractive, so is the price. One purchaser writes, "I enclose you order for another 6 H.P. engine; give me the agency for my county and I can make \$100.00 an engine over your price and sell dozens at that." We make single cylinder in sizes 4, 6, 8, 10, 12½ and 15 H.P. Double cylinder 20, 25 and 30 H.P. Marine engines to 40 H.P.

#### A FEW OF THE LETTERS WE GET.

The testimony of users is the highest indorsement.

PIERCE CITY, Mo., Mar. 2, '06.  
Gentlemen:—Allow me to thank you for the time you have allowed me to test the 10 H.P. gas engine bought from you. It develops full power and more and every one who sees it says it is the best and smoothest running engine he has ever seen. You can refer any one to me.  
Yours respectfully,  
H. V. Worley.

JONES CITY, Okla.  
Gentlemen:—I thought I would write you and let you know about my engine. I believe you make the best engine on earth. It is a dandy to start and the cooling is perfect. I also think the spark maker is elegant. I have had a lot of experience in engines but I think you have the best engine on earth.  
Yours very truly,  
A. W. Deal.

COLLINS, N. Y.  
Dear Sirs:—I would not take a farm for my 4 H.P. engine, purchased from you, if I could not get another. It is all I bargained for and more too. I took a test and it cost me one and one-half cents per hour to run it. Wishing you success, I am,  
Yours very truly,  
George Krebs.

BEAR IN MIND, These engines are designed to give results. WRITE TODAY, stating size you want also machines you run. Circulars sent free.

THE ROBERTSON MANUFACTURING CO.,  
BUFFALO, N. Y.

High Grade Engine Makers.

Special  
Prices to  
Carriage Makers  
and Blacksmiths  
if this paper  
is mentioned.



Fig. 900, 12 inches.



Fig. 822, 32 inch.

# Carriage Maker and Blacksmith Tools

**Fig. 900, "Elite," Silver Blower** (*patent applied for*) is distinctive in design, has cut gearing and removable, interchangeable bronze bearings for gear pinions. The gearing is self contained and attached to side of fan case, has an outer bearing plate over it and is thus permanently secured so that there is no unnecessary friction or lost power. The gear covering is removable without disturbing the gearing or paddle spider. There is a light tuyere for clay lining and a heavy one to use without lining. All parts are interchangeable.

**Fig. 822, Band Saws** are made in sizes 20 and 26 inch for foot or belt power and 32 and 36 inch for belt power. They are properly constructed, nicely finished, adapted to factory and repair work of every kind and give unusual satisfaction.

**Fig. 718, Spoke Tenon Machine** cuts tenons  $\frac{1}{4}$  to 2 inches diameter up to 6 inches long and also bores the felloe.

**Fig. 709, Taper Hub Boxing Machine** is made as illustrated, on legs and also without legs to mount on bench. It bores tapering holes in the hubs for the boxes and cuts the recesses for nuts and collars.

Made also for hand and power.

Also Forges, and a complete line of Hand and Power Drills.

Manufactured by

— THE —  
SILVER MFG. CO.,

365 Broadway,

SALEM, OHIO.



Fig. 709.

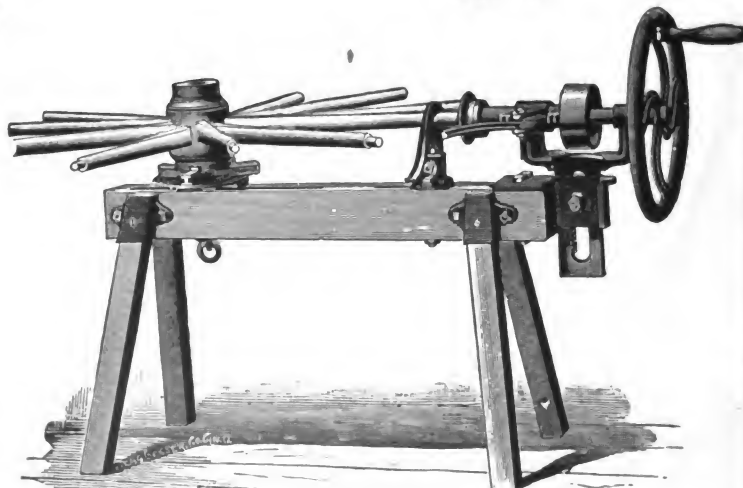
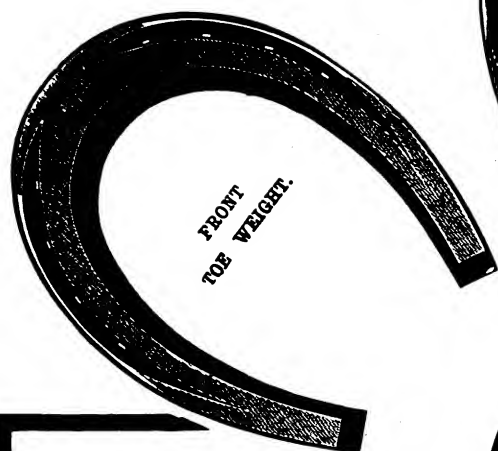


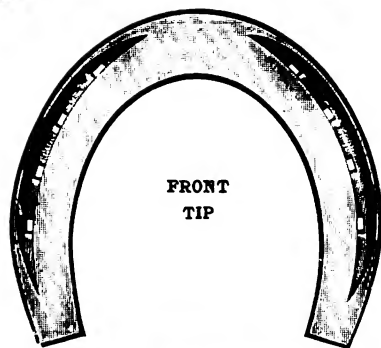
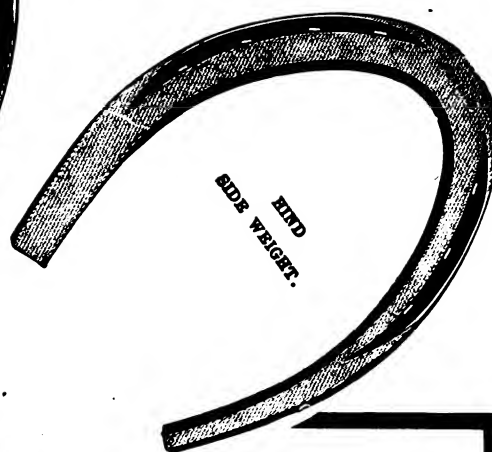
Fig. 718.



★**PERKINS**★  
HORSE SHOES  
AND  
TOE CALKS  
THE **STAR** BRAND



★**PERKINS**★  
HORSE SHOES  
AND  
TOE CALKS  
The **SUPERIOR** Kind



**PERKINS**  
**SHOES**

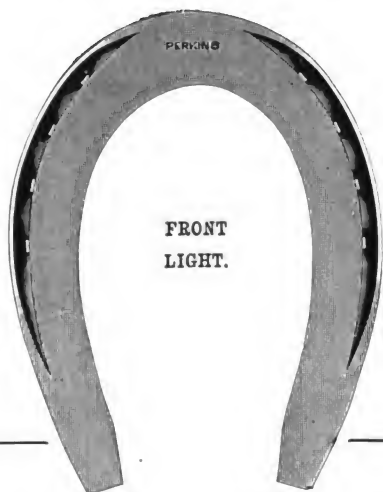
Have more points of superiority than any other make. An up-to-date shoe for up-to-date Blacksmiths. .

OUR  
Complete  
Catalogue  
SENT FREE.  
Write Today.

**PERKINS**  
**SHOES**

Are acknowledged by all users to have no equal. Made in all Styles and Sizes. Sold at Reasonable Prices.

Send  
for Samples New  
Pattern Front  
Extra Light and Light.  
Free for asking.



**PERKINS**

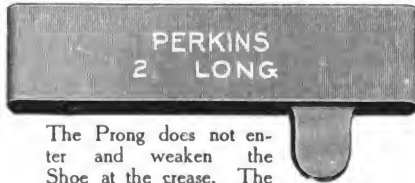
Made in Medium and Long, both blunt and sharp. Packed in 25 lb. boxes.



The Steel (our own make) is best suited for Calks; welds with sand and wears well. Perfectly graded in Length and Size.

**TOE CALKS**

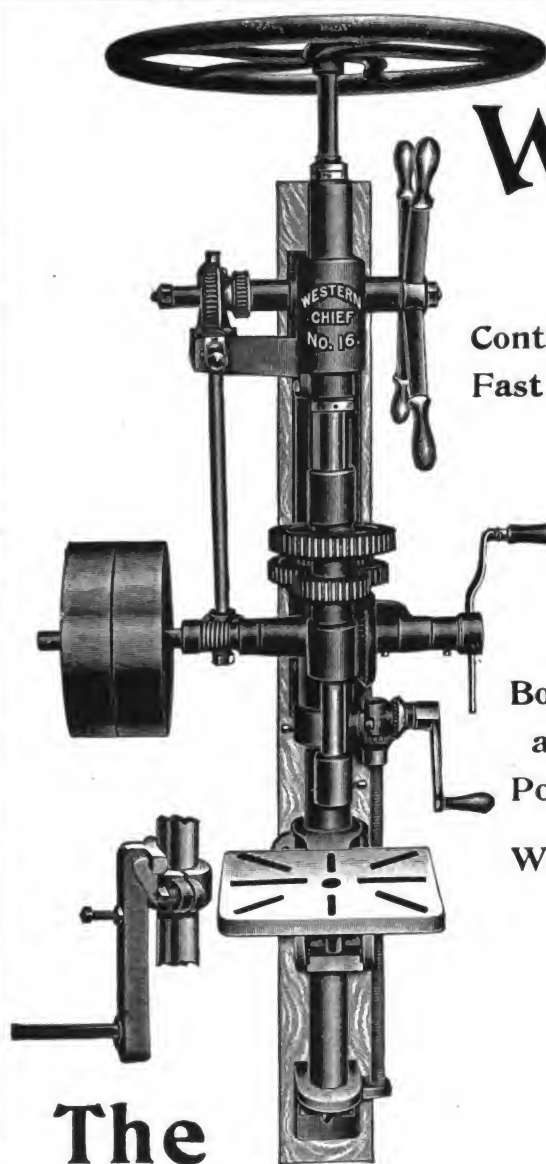
Chisel Pointed Prong. These cuts show exact size of No. 2. SAMPLES SENT FREE.



The Prong does not enter and weaken the Shoe at the crease. The only slightly curved Calk sold.

MANUFACTURED BY

**RHODE ISLAND PERKINS HORSE SHOE COMPANY**  
**PROVIDENCE, RHODE ISLAND.**



# No. 16 Western Chief DRILL

Continuous Screw Feed.

Hand Lever Feed.

Fast and Slow Speed.

All Gears are Cut.

Raise and Lower to Table.

Drills to center of 24-inch circle.

Bores 0 to 1½ in.

Spindle runs up and down 8½ inches.

Table runs up and down 16½ inches.

Both Hand  
and Pulley  
Power.

Weights  
360 lbs.



MADE BY  
**CANEDY-  
OTTO  
MFG.CO.**

CHICAGO  
HEIGHTS  
ILL.

## The Royal Blower

is absolutely free from all spiral or worm gears, and has not a ball bearing in it. Spiral and worm gears are short lived, and ball bearings are not suited to such high speeds. Phosphor bronze is used for the lead gear and bearings; and steel for the pinions and shafts. It is the simplest, lightest running and surest worker of any Blower on this day's market.

FAN, 12 inches diameter.  
FIRE POT, 9x11½ x 4, inside.



➔ Royal and  
Western Chief  
Forges, Blowers  
and Drills are  
sold by every  
First-class Dealer  
in the World.

**Ask For  
Them.**



## The Reason Why MORGAN & WRIGHT HOOF PADS

Have made such a decided hit with wide-awake blacksmiths is due ALMOST WHOLLY to this fact:

They have educated hundreds of horse-owners to the pad-using idea by PROVING to them that GOOD pads are a BIG HELP in keeping a horse in workable condition. And by giving the owner MORE SERVICE FOR HIS MONEY than he has been in the habit of getting from other brands, the smith has been able to get a BIG HOLD upon the pad business of his community.

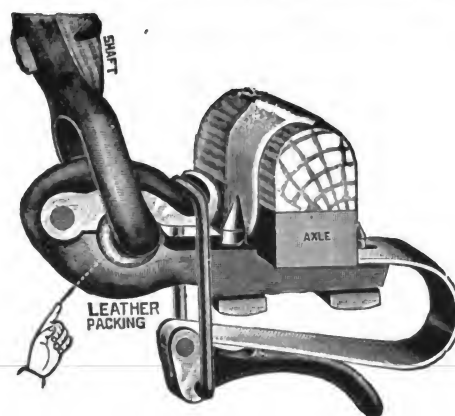
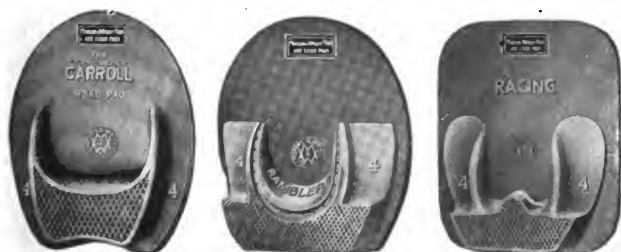
This is not idle talk. Ask any smith who makes a SPECIALTY of M. & W. Pads WHY he finds it profitable to do so.

**A Pad for Every Purpose--15 in all.**

Every Pad a friend-maker for the Blacksmith.

Ask your Jobber.

**MORGAN & WRIGHT**  
**Chicago.**



Coupling Closed

## The Bradley Shaft Coupling

**NEVER SQUEAKS or SIDE RATTLES**

It cannot—for three reasons:

The leather packing is perfectly lubricated before it is put in the coupler.

The ball and socket construction holds equally secure in all directions.

The constant and uniform pressure of the spring automatically takes up the wear.

These features are the most important in a Shaft Coupling because of the object attained—ABSOLUTE NOISELESSNESS—not for A time, but for ALL time. **DON'T FORGET THE HOLFAST COUPLER.**

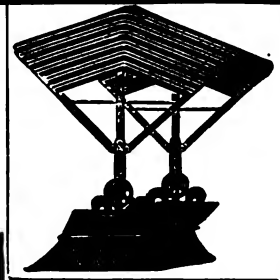
**C. C. Bradley & Son**  
SYRACUSE, N. Y.



## What COL. SPRAGUE Makes.

Wagon Umbrellas,  
3-Bow Tops,  
Carriage Canopies,  
Auto Tops, Lawn Canopies.

**MADE THE SPRAGUE WAY.**



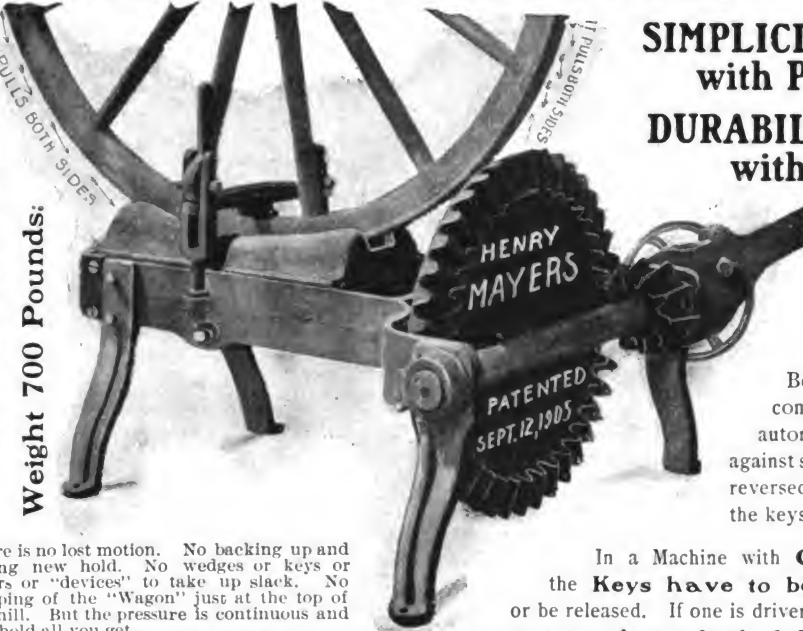
Send for Catalogues.

THE SPRAGUE UMBRELLA CO., Norwalk, Ohio.

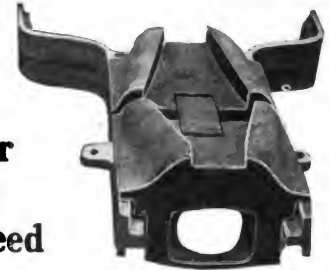
## MAYERS COLD TIRE SETTER.

EVERY OUNCE, PIECE and PART  
WARRANTED STEEL.

Weight 700 Pounds:



SIMPLICITY  
with Power  
DURABILITY  
with Speed



The only Cold Tire Setter made in which **BOTH HEADS** come together at **same time**. Both sides of the tire get the **same pressure**. A  $3\frac{1}{2}$  inch (in diameter) Machine Steel Screw with Right and Left Handed Nuts with powerful Beveled Gears does it. **Both Heads** coming together at **SAME TIME**, the Grip keys automatically take hold and set **THEMSELVES** against side of tire. After tire is set and lever is reversed and heads come apart at **SAME TIME** the keys **HAVE** to turn loose.

There is no lost motion. No backing up and taking new hold. No wedges or keys or levers or "devices" to take up slack. No stopping of the "Wagon" just at the top of the hill. But the pressure is continuous and you hold all you get.  
Just turn the Screw—that's all.

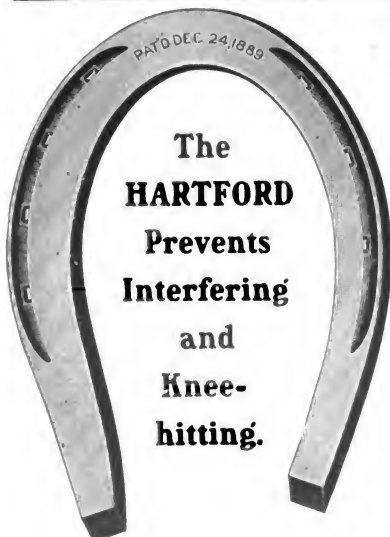
In a Machine with **ONE DEAD** or **STATIONARY**, the **Keys have to be hammered or driven** to take hold or be released. If one is driven harder than the others, **Result? Easy to see. A tire kinked SIDEWAYS.**

In our first Six Months we sold machines in Ten States. Let us send you our Catalogue, showing five views of machine, and testimonials as to its work.

**HENRY MAYERS MACHINERY CO.**

1721-23 North Eighth Street,

ST. LOUIS, MO.



Do You Use the Best  
Side Weight  
And Toe Weight Shoes

Made in this Country?

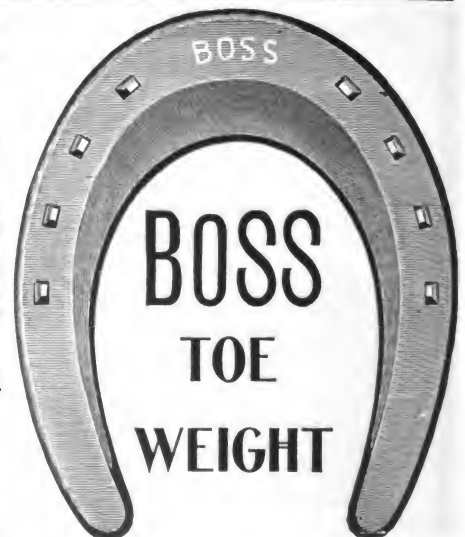
**BOSS AND HARTFORD SHOES**

have the highest reputation among the trade. Cost same as inferior makes, mean less labor. Are far superior to a hand made shoe. Carried by all Leading Jobbers.

SEND FOR CIRCULARS.

Sample pair of either size or weight mailed post paid on receipt of 50 cents.

**THE SIDE-WEIGHT  
HORSE SHOE COMPANY,**  
Mechanic St., HARTFORD, CONN.





## Know what I'm talking about

when you say "PIONEER SHAFT ENDS". I've been in the factory and helped make 'em. Honest built from the inside to the outside. At the core, a hard wood stick shaped like the end of a shaft—a heavy steel tube covering that and another tube seamed and locked that fits over the inner one, a double tube the entire length. This double barreled tube extends beyond the wood core, and all you have to do when repairing a broken shaft is to saw it off square and shove it into the open end of the tube, butting it right up against the wood inside—put in the rivet and the job is done.



The outer tube is finished with two coats of fine black enamel, baked on by steam—all the elasticity and lustre of the enamel retained by this process—as fine a finish as any patent leather you ever saw; one of our steel drawn shaft tips, finely nickel plated, to finish the end. Is it strong enough at the joint? Well, if you don't care about marring the finish, jump on it a few times. You've got to break a double steel tube and it will take a few jumps.

The folks have an attractive poster that tells the story at a glance. It would look well in your shop and would help your business. Tell them your address—they'll do the rest.

The "PIONEERS" are in stock with almost every dealer in Blacksmiths' supplies and if you don't know where to get them, write

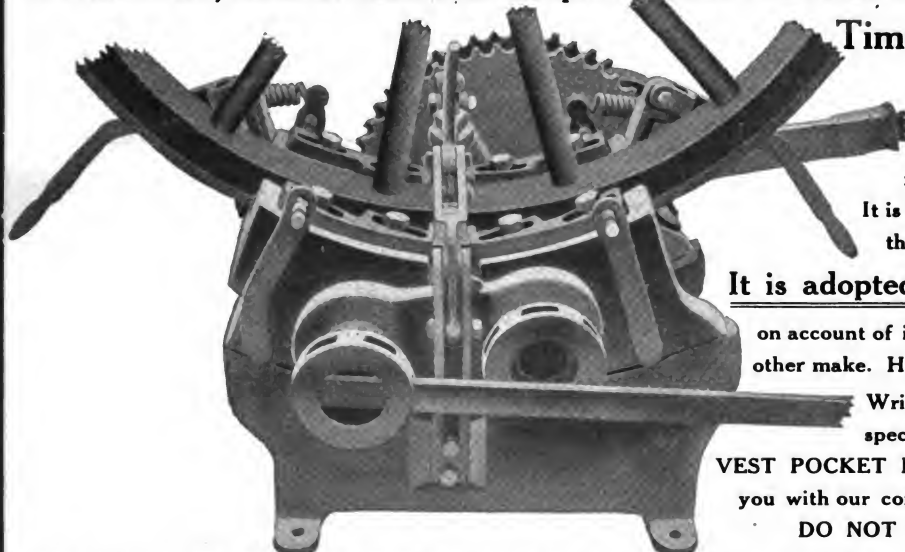
**Crandal, Stone & Company,**  
BINGHAMTON, N. Y.

They know.



## YOU ARE THE MAN

Who would be setting the hundreds of tires that others are setting in your locality every year, if you had a BROOKS. It gets the business. It sets all sizes of tires by compressing the metal cold. It does the work in from two to five minutes. It is the only machine that has an automatic device for gripping the tires so that the keys will not slip. The BROOKS is the easiest operated, the strongest in construction, the most durable and compact Cold Tire Setter built.



### Time and Experience Must Precede Perfection

The BROOKS is built by the oldest manufacturers of edge grip machines. It is the superior of all others and receives the highest awards wherever shown.

### It is adopted by the Government Shops

on account of its demonstrated superiority over every other make. Has no equal for rapid and accurate work.

Write us for DESCRIPTIVE BOOKLET, special terms and free trial, and a handy VEST POCKET MEMORANDUM BOOK will be sent you with our compliments.

DO NOT DELAY—WRITE TODAY.

**THE BROOKS TIRE MACHINE COMPANY**  
121 North Water Street, WICHITA, KANSAS.

# A ROYAL WESTERN CHIEF BLOWER GIVEN AWAY ABSOLUTELY FREE TO YOU.



**W**HEN you buy your supplies from us, you not only get more goods for your money, than from any other house in the United States, but you share in the profits we make on the orders you send us. Our stock of

## Blacksmiths and Wagon-Makers Supplies

is the most complete ever carried by any house, and on account of our selling our goods by catalog only, thereby eliminating the enormous expense of drummers, collectors, and book-keepers, common to all credit houses, and on account of doing a cash business only, we are able to sell our goods cheaper than any other house in the United States. Our stock of plow supplies, and spring goods, wood material and tools is very large and our prices lower than you ever heard of before. Besides, buying your goods at much lower prices than you ever paid before, **YOU SHARE IN THE PROFITS OF OUR BUSINESS, AS OUTLINED IN OUR PROFIT SHARING PLAN, BELOW.**

## OUR PROFIT SHARING PLAN.

We want to do business with every machinist, blacksmith and wagon-maker in the United States, we want to save you money on your supplies, we want to give you better goods for your money than you have been getting from your supply house, and besides this, we want you to share in the profits of the larger business we will do on account of the large orders you will send us. In order to do this, we must sell you all your supplies, and your neighbor blacksmiths or machinists, all their supplies. If you deal with us, we will please you so much with our goods and our prices that you will try to get your neighbor blacksmiths and machinists to buy from us, and you will ask your farmer customers to order their supplies from you. This will not be much work for you to do, but for doing it, we want you to share in the profits that we will make on account of the extra orders that you will get for us.

Commencing April 1st, every invoice we send out will itself be a PROFIT SHARING certificate, and when these invoices aggregate certain amounts, as shown in the PROFIT SHARING section of our No. 63 catalog, which will be ready for you May 1st, you will be entitled to very liberal premiums, according to the amount of your purchases from us. For example, when your invoices show that since April 1st, you have purchased from us, goods to the amount of one hundred dollars, return the invoices to us, and we will send you one of our Reynolds

Tire Bolting machines, absolutely free of charge and when your purchases have amounted to three hundred dollars, you will be entitled to one of our Royal Western Chief Blowers, as shown in the above illustration, absolutely free of charge, free to you as a premium and as your share of the profit we have made on your purchases and to pay you for your trouble getting orders for us. Our PROFIT SHARING SECTION will show many more useful and necessary articles that you can get absolutely free by buying your goods from us, and at the same

time you will be saving money for yourself because of our very low prices.

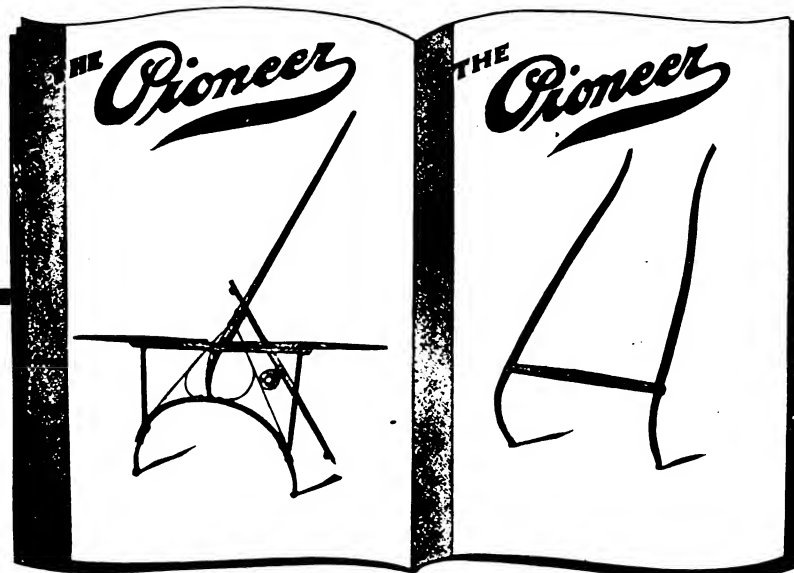
We make this very liberal offer because we want your entire trade, we want to sell you all of your supplies and tools, and we want you to work for us by getting us new customers and taking orders for us from your customers. Every order you send us after April 1st, 1906, will entitle you to a share in our profits, and even though it takes you one or two years to purchase sufficient goods to entitle you to any premium, your certificates will always be good.

Our No. 62 catalog, is the most complete blacksmiths and wagon-makers supply catalog ever issued. In it is shown a complete line of plow supplies, wagon supplies, iron, steel, and mechanics tools of every description, besides buggy tops, paper and metal roofing, garden tools, etc. And the prices we make are lower, than those of any other supply house in the United States. We want you to have one of these books, which we will send you free. The book contains nearly 200 pages, and thousands of illustrations of everything for blacksmiths, horseshoers, wagon makers, and machinists use, and at prices much lower than you ever heard of before. Send for it today, it is free to you.

## HAYSLER IRON COMPANY,

Cheapest Blacksmiths, Wagon-Makers and Mechanics  
Tool House in the United States.

KANSAS CITY, MO.

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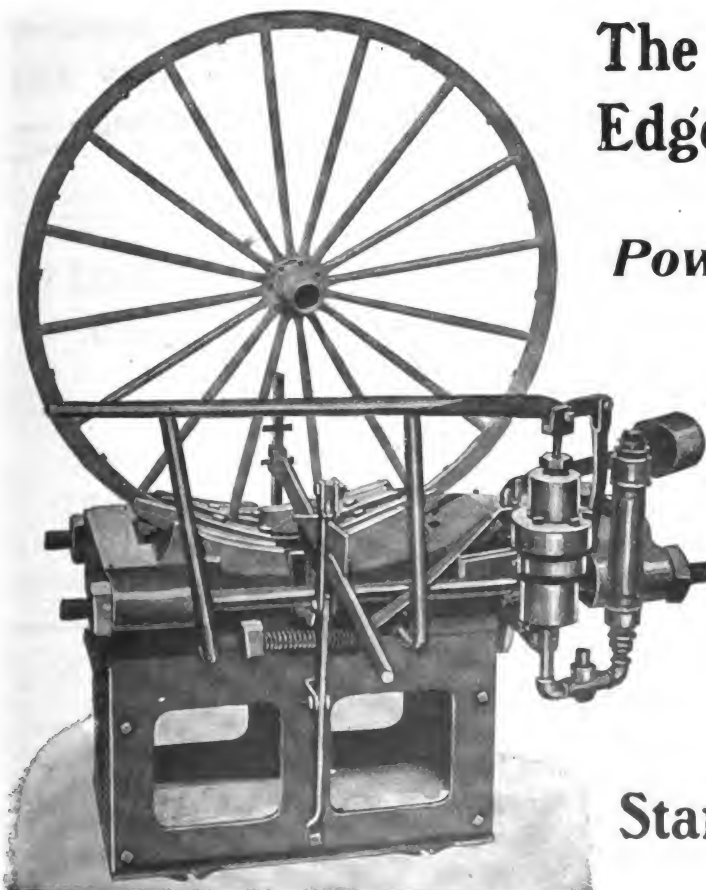
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***SEND FOR THIS BOOK***

**W**E would like to have your permission to send you a copy of our Catalogue, showing the different styles and sizes of poles and shafts manufactured by us.

The PIONEER BRAND has been brought to a standard of excellence in quality and style by the result of years of labor and study of the trade's wants, and is recognized as the peer, as is attested to by the most critical manufacturer, and is demanded by all buyers of vehicles throughout the country. Address all communications to

**The PIONEER POLE & SHAFT CO., Piqua, Ohio.**



## The Scientific, Hydraulic Edge Grip Cold Tire Setter

Sets tires cold by a few strokes of a

***Powerful Hydraulic Pump***

### The Warranty Tells the Tale.

It is warranted to work as well in every respect, or better, than any other edge grip tire setter and in addition is warranted to work much

### EASIER AND QUICKER.

These are two most valuable points in a hand power cold tire setter.

Its gripping jaws grip the tires accurately and let go quickly without the use of hammer.

**After setting over 400 tires Mr. Brown writes as follows:**

WORTHAM, Texas, February 3, 1906.

Gentlemen—In reply to your letter concerning the Scientific Tire Setter, will say that it is the easiest and quickest cold tire setter I ever saw operated. A man can set tires faster than one man can take them off and roll them in the shop and roll them out and put them on.

Yours truly,

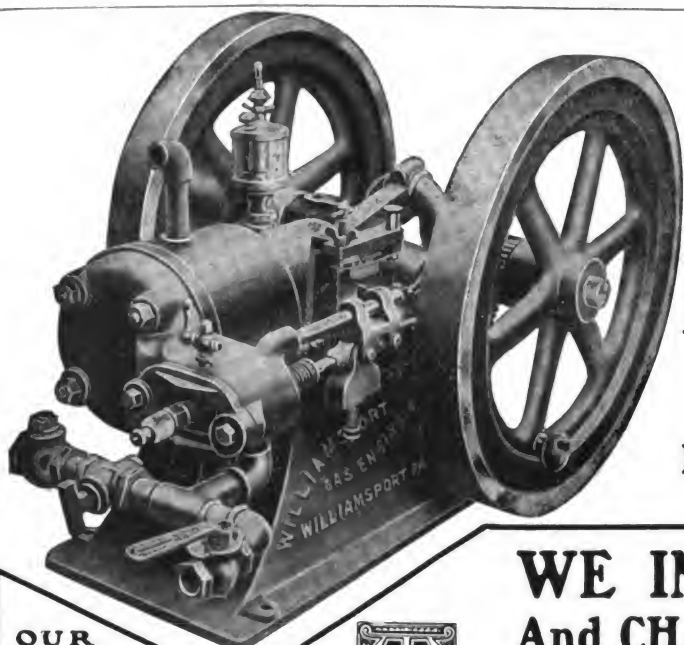
T. L. BROWN.

**Will you buy a machine if it will work as fast as Mr. Brown says it will?**

For full information, address,

**Standard Tire Setter Co.**

**KEOKUK, IOWA**



## THE WILLIAMSPORT GAS AND GASOLENE ENGINE

2 to 25 Horse Power

Always Ready to Start

No Engineer Required

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OUR  
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The Best on the Market  
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WILLIAMSPORT ENGINES are constructed by the most skilled workmen, and only the very best material used. We offer you an Engine of the Finest Quality, noted for its Simplicity, Durability, Ease of Operation and Beauty of Design. Our broad Guarantee covers all.

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All Engines Absolutely Guaranteed free from all defects in workmanship and material. Any part found defective or faulty will be replaced by us free within one year from date of purchase.

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Price list sent upon application.

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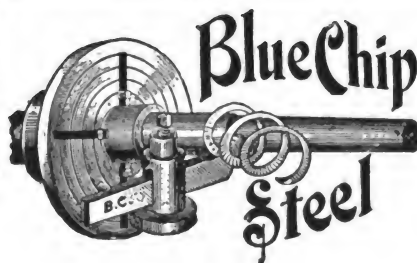
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Special Net Price on Sarven Patent Wheels  
(C. B. 50c. extra) with steel and rubber tire

Size of tread	Price per set for wheels with flat steel tire on and hubs bored	Price per set for wheels complete with channel and rubber tire on, and hubs bored			Add to price of wheels for axles and boxes set
		36 and 40	38 and 40	40 and 44	
3/8	\$5.75	\$13.50	\$14.00	\$14.50	\$1.90 L.D.
1/2	5.85	14.50	15.00	15.50	1.90 "
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1 3/8	8.25	24.00	25.00	26.00	2.25 H.P.

Repair Wheels, \$3.75.

PROMPT SHIPMENTS. Five or more, one order, you can deduct 25c. per set as freight allowance. Write for catalogue. We manufacture wheels with Steel or Rubber Tire on 3/4 to 4 in. tread. Buggy Gears with wheels and shaft all ready for body, \$15.50.

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## THREE-GROOVE BIT STOCK COUNTERSINKS



Included angle of  
cutting point is 83°  
Counterbores with  
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M. T. D. & M. Co. Tools are first class in every respect, both as to quality and workmanship and the fact that they have been sold for many years and in increasing numbers in England, Germany and other European countries is evidence that M. T. D. & M. Co. goods are competitive.



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**In the Coal Mines of Pennsylvania Capewell Horse Nails**  
**are Used and They Stand the Test.**

"The Capewell Nail is the BEST I Ever Used."

THE CAPEWELL HORSE NAIL CO.,  
 Gentlemen:—

I have given Capewell horse nails a good test. I am using them these last eight years in the Anthracite Coal Mines of Pennsylvania, where the roads are not the best by a long way. I am shoeing 130 mules in the mines and ought to know what the nail is. Have been shoeing for the last twenty years and have used all kinds of horse nails, but *the Capewell nail is the best I ever used.*

Yours respectfully,

THOS. W. BLANDFORD.

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PLAIN PATTERN REGULAR HEAD.

PLAIN PATTERN CITY HEAD.

**Capewell Nails are Flexible Enough to Clinch Easily, and so Tough**  
**that they will not Break under the Severest Strain in Service.**

Made by **The Capewell Horse Nail Company**  
**HARTFORD, CONN.**

The Largest Manufacturers of Horse Shoe Nails in the World.

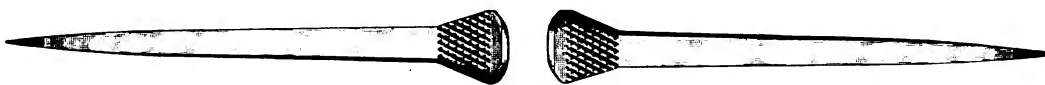
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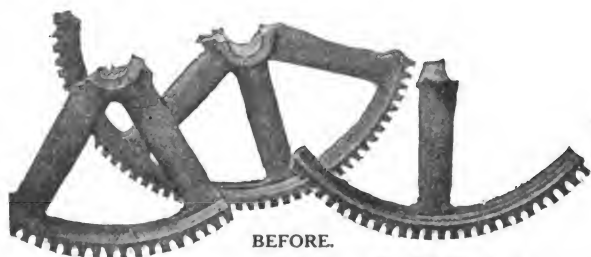
WILL DO.

TRADE **WELDARINE** MARK.

AN EYE OPENING  
PROPOSITION

TO

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MACHINISTS**



BEFORE.



AFTER.

**AND REPAIRERS OF MACHINERY**

With WELDARINE you can braze any casting that you can get hot and make it as good as ever without patches of any kind.

With WELDARINE you can braze cast-iron or any form of iron or steel, cast-iron to steel or cast-iron to copper.

WELDARINE can be used successfully in an ordinary forge or with a brazing torch.

There is not a shop, manufacturing plant and scarcely a household in which there is not some broken cast-iron article which the owner would have repaired if it could be done neatly and at a moderate price.

WELDARINE at once opens up a new and PROFITABLE field for anyone who will cultivate it. Let it be known that you can braze cast-iron; braze a few pieces and the knowledge of it will soon get around and bring you a continually increasing amount of work.

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I have given your "Weldarine" a thorough test and find it to be just what you claim it to be.  
**BAILEY REPAIR CO.**

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I have used "Weldarine" on jobs 25c. up to \$15, and all have given entire satisfaction. It is a money-maker, and I will always keep it on hand.  
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Our foreman says that "Weldarine" is the only compound on the market that will braze cast-iron successfully. We have a great deal of this work to do, and with the aid of Weldarine have doubled our repair business.  
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One set of WELDARINE will do from \$50 to \$75 worth of work. Costs you \$4.00 per set. Put up in four packages and quick kleaner in a neat wooden box.

**SAMPLE SET, ONE DOLLAR.**

If your Jobber is not at this time handling WELDARINE, send us \$1.00 for a sample set of WELDARINE that will do from \$10 to \$15 worth of work, or \$4.00 for full working set. Sent charges prepaid, to any address.

Satisfaction guaranteed or money refunded.

Kindly give us name of your Jobber, and we will arrange for him to supply your future needs.

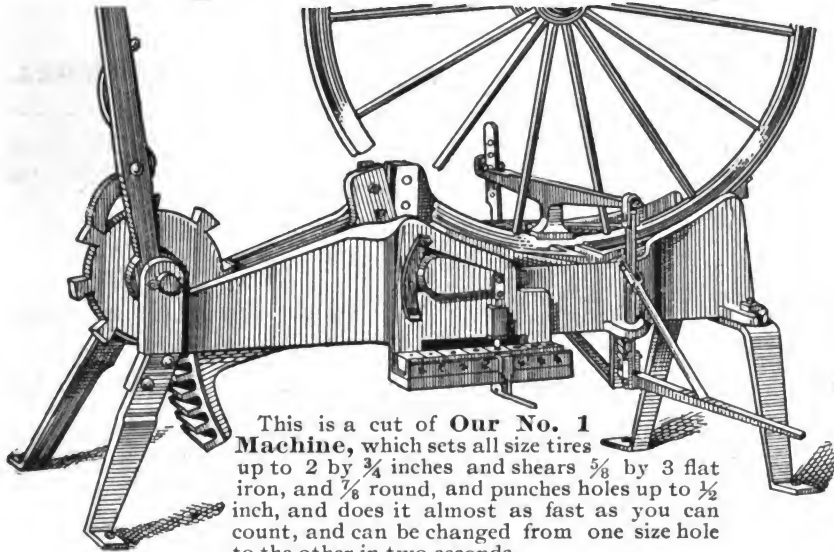
**THE WELDARINE MANUFACTURING COMPANY,**

(Incorporated)

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Cable Address, "WELDARINE," Western Union Code.

# THE IMPROVED HOUSE COLD TIRE SETTER.



This is a cut of Our No. 1 Machine, which sets all size tires up to 2 by  $\frac{3}{4}$  inches and shears  $\frac{5}{8}$  by 3 flat iron, and  $\frac{7}{8}$  round, and punches holes up to  $\frac{1}{2}$  inch, and does it almost as fast as you can count, and can be changed from one size hole to the other in two seconds.

Thousands of these Machines in successful use and on the market just four years. They have stood the test. Not one has been abandoned or broken up. We will be pleased to furnish you with the names of customers who have cleared \$2,000 per year on them, and names of those who have made single-handed \$60.00 in a single day. It costs nothing to keep in repair and will never wear out, and all you take in on it is clear profit.

Write us for catalogue and prices.

## HOUSE COLD TIRE SETTER CO.,

Office and Factory, 216-220 So. Third Street,

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By using tire setter frame for shear and punch we produce same with little additional cost, and can make each customer

a present of a  
**Shear and Punch worth  
at least \$80.00.**

Our No. 2 Machine has both hand and power attachments and easily sets all ordinary tires up to 1 by  $4\frac{1}{2}$  inches, and shears  $1\frac{1}{4}$  by 5 flat iron,  $1\frac{1}{4}$  round, and cuts off axles up to  $1\frac{1}{2}$  square and will punch all size holes up to  $\frac{3}{4}$ .

## OUR ROTARY DRILL

*Has no  
Sprocket  
Wheels,  
Belts, Chains,  
or Springs.*

*No Separate  
Horse Power  
nor  
Tumbling Rods.*



## THE POWER IS DIRECT TO THE MACHINE

It is easy work for one man and one team to drill to the depth of 400 feet. One man and one team can set it up and begin drilling in 10 minutes.

Drill turns its own rope and drill bit never strikes twice in the same place, as drill bar revolves automatically. Will cut from hardest granite to dirt, and excels in quick sand. We carry drill supplies in stock. WRITE FOR PRICES.

**Fort Smith Well Drill Mfg. Co.,  
FORT SMITH, ARK.**

A Good Set of Bit, Brace, Nut Wrenches is almost a necessity. A postal sent to us will bring net delivered price.



Do you want a Screw Plate cutting  $\frac{1}{4}$  to  $\frac{3}{4}$ ? Now is a good time to buy. Send for price delivered to nearest R. Station. CATALOG FREE

## DON'T BUY A SCREW PLATE

—Until you know what the "REECE" IMPROVED SCREW PLATES cost and have heard our arguments in their favor. It Pays to look around before you buy and find out all you can about the different makes. You will find that the "REECE" SCREW PLATES have more points of **REAL MERIT** than any other kind. You will find that you always get about what you pay for. Low prices mean cheap goods. Our prices are not excessive and when you get a "REECE" SCREW PLATE you get one that will cost only a trifle more than a cheap screw plate and outwear two of them. Quality counts every time.

SOLE MANUFACTURERS  
**THE E. F. REECE CO.,  
GREENFIELD, MASS., U. S. A.**



No. 8 REGULAR HEAD.—Exact size.

**"NEW STANDARD" HORSE NAILS**

The letter "S" appears on the head of each nail.



No. 8 CITY HEAD.

Exact size.

**Best Nail in the World BAR NONE.****DEALERS' NET PRICES TO SHOERS.**

No....	5	6	7	8	9	10	11	12
Box....	\$4.75	4.00	3.75	3.50	3.25	3.25	3.00	3.00
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Uniform Horse Nails. In length, breadth, thickness, blades, points, quality and PRICE, and the best driving and holding nail ever produced.

We mean every statement made above.

Manufactured and Guaranteed by

**STANDARD HORSE NAIL CO., New Brighton, Pa.****Your Hack Saw Troubles**

will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



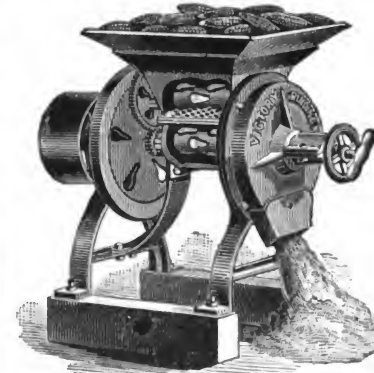
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Now made  
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carbon steel.

Guaranteed to be stronger and more rigid than solid steel axles. We make both. Write us

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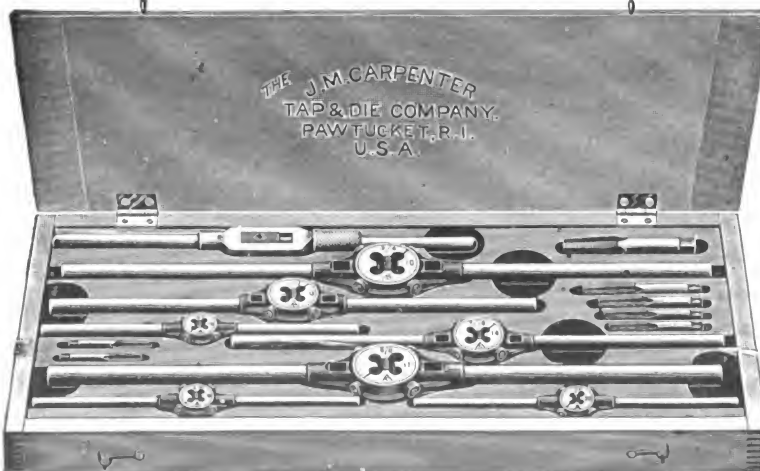
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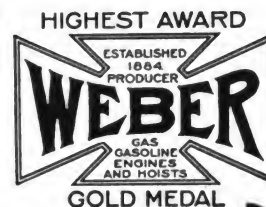
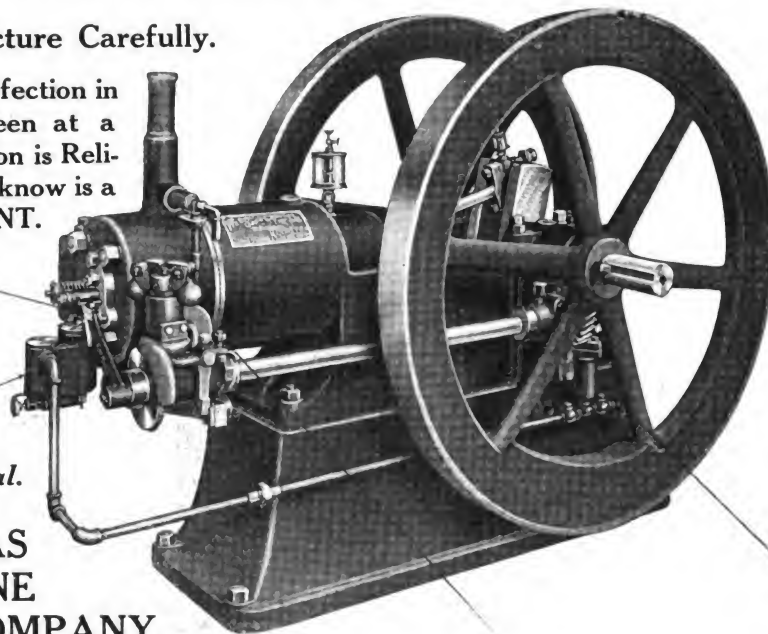
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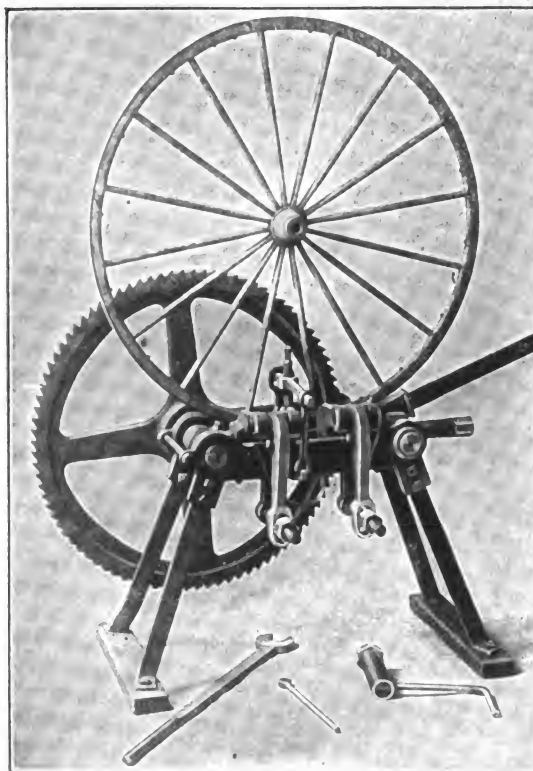
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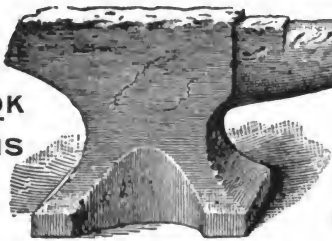
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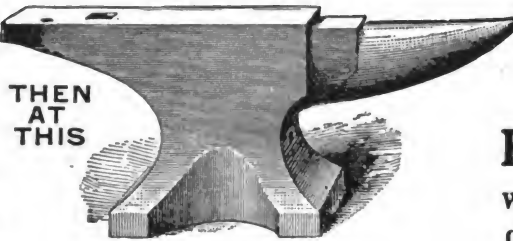
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WRITE  
FOR  
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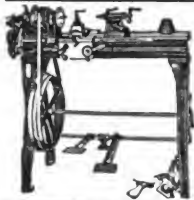
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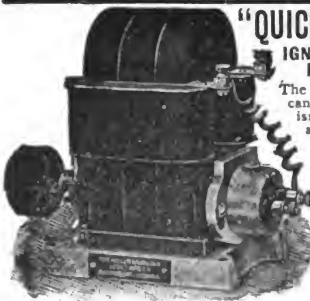
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Badger Engines enable the blacksmith to make the most money out of his time by enabling him to do more, better and a greater variety of work, and at the same time employ less help—saving cost of helpers.

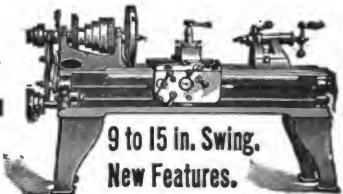
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Write for attractive terms.

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**3**



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New Features.

**SEBASTIAN LATHES are Good Lathes**  
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TIRE SHRINKER TIRE BENDER

FOR PROGRESSIVE BLACKSMITHS

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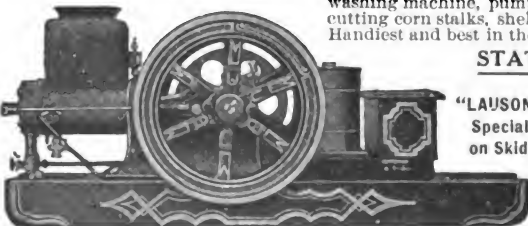
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All Types-2 to 20 H.P.

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Special  
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Let us tell you more about our line of Engines and why they are superior to other makes. Write today for our large illustrated catalogue: use your letter head when writing for prices. State your wants and we will give you full information. Special agency proposition to Blacksmiths in unoccupied territory.

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Our Blacksmith's Special  
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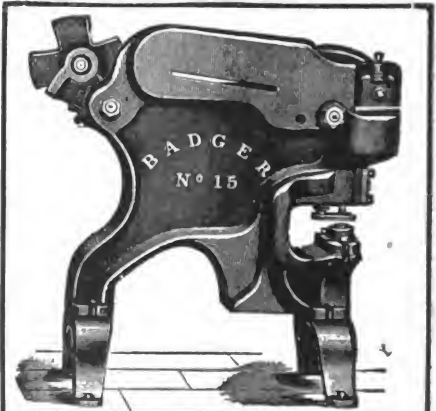
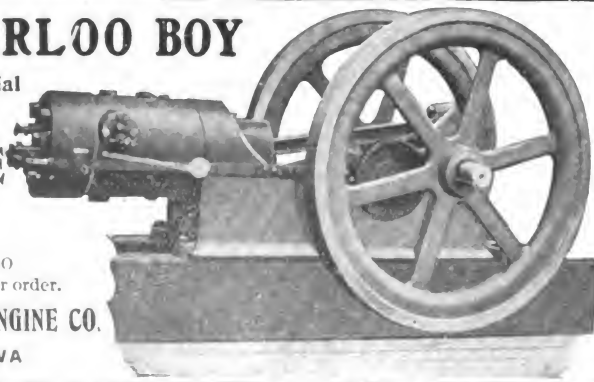
## GASOLINE ENGINE

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WATERLOO, IOWA



Weight 800 lbs.

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Here is a Punch and Shear that will punch and shear just as we say with

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Punch 5/8 in. hole in 1/2 in. Iron  
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### GOOD HORSE SHOE PADS.

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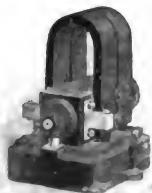
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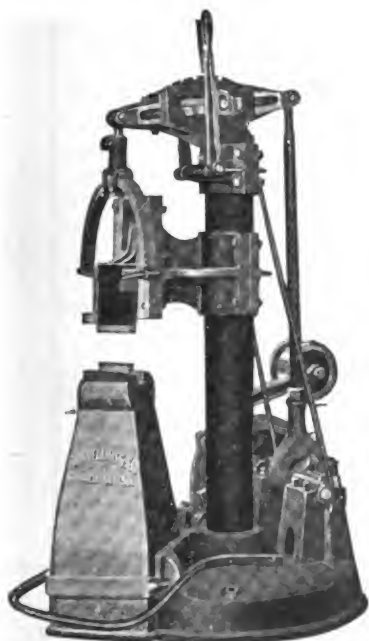
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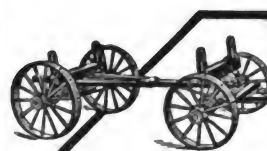
The shifting lever controls the length of stroke.

Set it in any one of the five notches and then handle the hammer with the treadle the same as any other.

Actually five hammers in one.

Write any jobber or the

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A low wagon at a low price. Handy for the farmer. Will carry a load anywhere a horse can travel.

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soon earn their cost on any farm.

### Steel Wheels

for farm wagons. Straight or staggered spokes. Any size wanted, any width of tire. Hubs to fit any axle. For catalogue and prices, write to

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No matter what your position may be, whether day laborer or office worker, if you are in that discouraged line of men who get the same pittance week after week without prospect of anything better, it is time you appealed to the International Correspondence Schools. For 14 years they have been qualifying dissatisfied workers for better positions and higher salaries.

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Box 1302, Scranton, Pa.

Please send me your booklet, "1001 Stories of Success," and explain how I can qualify for the position before which I have marked X.

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Electrician  
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Contractor & Builder  
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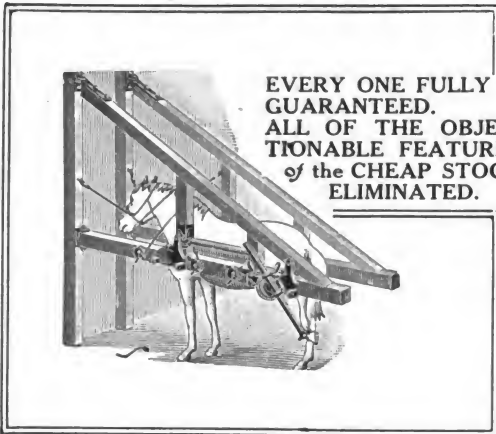
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St. & No. \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

# BARCUS Horse Stocks

In use in all Modern Shoeing Establishments. Satisfaction Everywhere.



EVERY ONE FULLY  
GUARANTEED.  
ALL OF THE OBJEC-  
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of the CHEAP STOCK  
ELIMINATED.

## FILL EVERY SHOP REQUIREMENT

They are simple, strong and solid, safe and sure to hold, have no ropes and pulleys to tangle and break, no bracing to roof or floor, can be quickly and easily adjusted to any position convenient to the shoer. More Barcus Stocks are used in the up-to-date shops throughout the country than any other horse stock on the market. Barcus Stocks are perfectly reliable and are fully guaranteed. True, they are not the CHEAPEST in price, but they are the BEST. You run no risk of being injured if you use Barcus Stocks to hold the vicious horse or mule.

Barcus Stocks are furnished complete with hinges ready to bolt to the stationary posts in your shop.

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GEO. BARCUS & Co.—Dear Sirs:—I feel it my duty to write you in regard to your horse stock. I have been in the business for the past twenty-six years and have never had anything like it in my shop. I would not part with it for double the cost of the machine. It is very handy for veterinary uses. The horsemen of this vicinity say that it "breaks a colt" to put it in the stock.

Yours truly, MARTIN DUNDON.

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MR. GEO. BARCUS:—I wish to say that the horse rack we bought of you gives perfect satisfaction in every respect. Yours respt.,

HODGINS & DOUGLASS.

## The Barcus Improved Toe Calk Machine

Has a record of five toes per minute, and this machine in your shop will save you in cash at the rate of \$6.00 per day when in use.

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SIRS:—I am well pleased with the Barcus Improved Toe Calk Machine.  
Yours very truly, FRANK NYE.

Write for Particulars.

**Geo. Barcus & Co.,**  
Box 61. WABASH, IND.

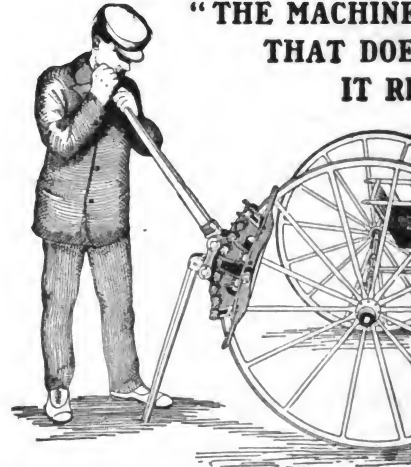


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Money  
Saver

# SCHAU TIRE SETTER

"THE MACHINE  
THAT DOES  
IT RIGHT."



## 3,000 SATISFIED USERS

IN THE

**United States & Canada**

### TESTIMONIALS.

Unsolicited and we have plenty of others.

NEWPORT, VT., Oct 3, 1903.  
THE BURTT MANUFACTURING CO.,  
Kalamazoo, Michigan,

Gentlemen:—Last July we purchased one of your Schau Cold Set Tire Setters and have used it with the greatest satisfaction. It draws trade that we never had before and the saving in time and bolts will pay for our machine in one year's time.

Respectfully yours,

FAIRBROTHER & GALE.

ST. GEORGE, Kans., May 27, '03.

MR. H. C. GRECK,  
Detroit, Mich.,

Dear Sir:—Your Tire Setter is the best machine on the market today for buggy tires. I can set a set of tires in less than thirty minutes.

Yours, J. J. NOLL.

FRANCONIA, N. H., Oct. 5, '03.

THE BURTT MFG. CO.,  
Gentlemen:—The Cold Tire Setter we bought of you has given us perfect satisfaction. We set all of our light tires with it.

Yours very truly,

C. H. COREY & CO.

JAMESTOWN, N. DAK., Oct. 6, '03.

THE BURTT MFG. CO.,

Kalamazoo, Mich.,

Dear Sirs:—The machine is O.K. I set tires so fast that I could not keep track of them. For a while I set 75 tires in one day with it, and never had to reset but one set of them.

Yours truly,

PHIL MASON.

**GET OUR COMPLETE  
CATALOGUE FREE**

**BURTT MFG. CO.,**  
**KALAMAZOO, MICH.**



# Buffalo 200 Blower

"PRIDE OF TODAY'S SMITHY"

Five Year's Protection against Repairs.

Built on Modern Mechanical Principles.

The Simplest Blower made—no adjustment needed. That is done once for all by expert mechanics in our own factory.

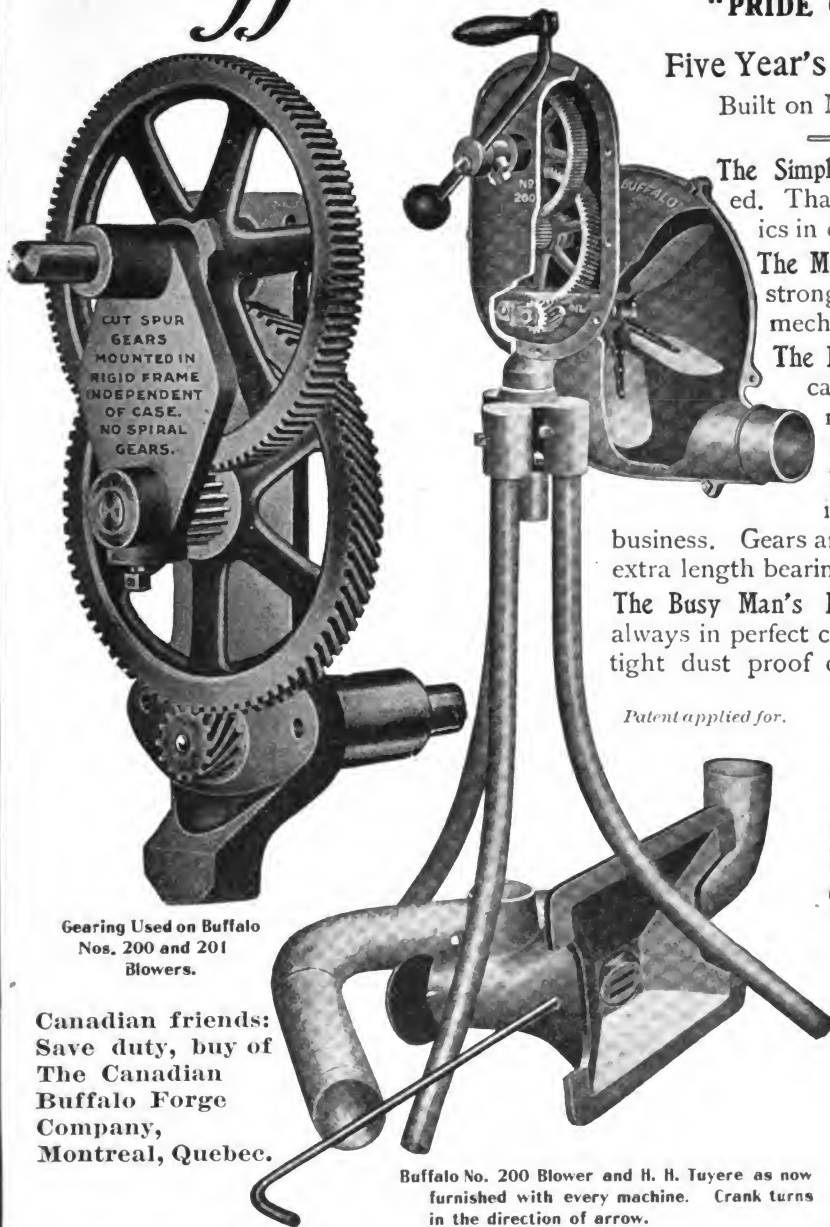
The Most Durable Blower—look at the gears, strong, large and heavy. No watch-case mechanism can stand a five year guarantee.

The Lightest Running Blower—our scroll fan case is the correct scientific one and gives more air per revolution with less power than any other form.

The Sturdiest Blower—no racking twisting or battering strain can put it out of business. Gears are held in a cast iron box frame with extra length bearings.

The Busy Man's Blower—oil it once a month and it is always in perfect condition. Gears run in oil in an air tight dust proof case.

Patent applied for.



Gearing Used on Buffalo Nos. 200 and 201 Blowers.

Canadian friends: Save duty, buy of The Canadian Buffalo Forge Company, Montreal, Quebec.

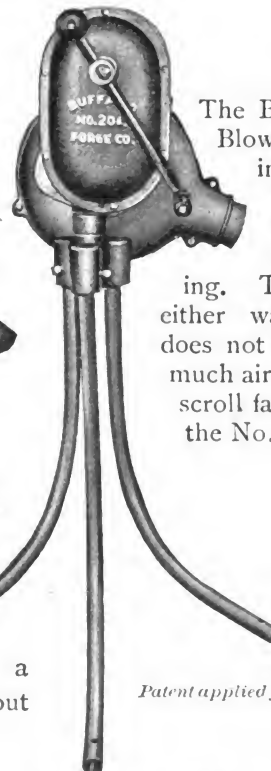
Buffalo No. 200 Blower and H. H. Tuyere as now furnished with every machine. Crank turns in the direction of arrow.

The Buffalo Nos. 200 and 201 Blowers are guaranteed to be more durable and easy running than any other blower on the market. They are sold under a positive guarantee for five years. Any part wearing out within that time will be replaced free of cost.

PLACED IN YOUR SHOP  
FOR FREE TRIAL.

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**BUFFALO FORGE COMPANY**  
BUFFALO, N. Y.



Patent applied for.

Buffalo No. 201 Blower furnished with H. H. Tuyere.



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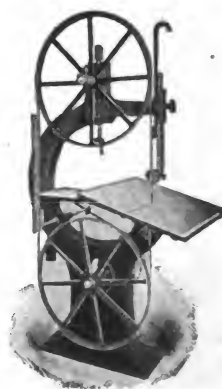
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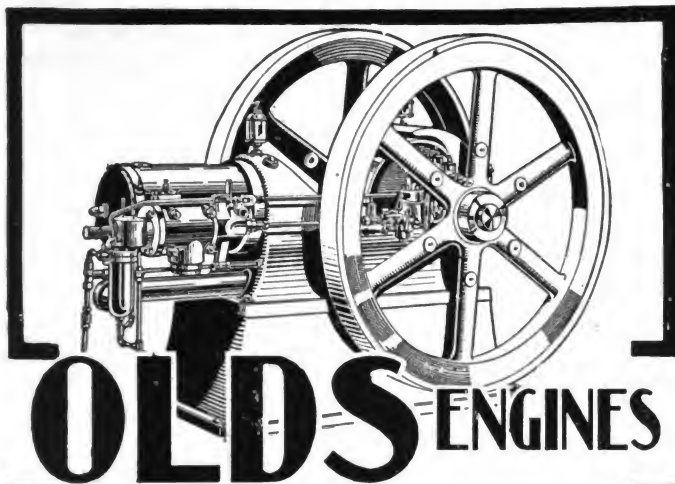
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YES—IF YOU USE  
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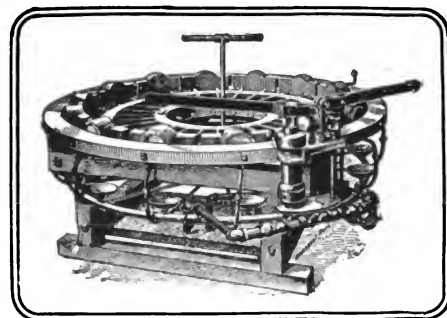
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Our carriage paints are ground in fine coach varnish of our own manufacture. Dries quickly with a handsome gloss and durable finish. Every gallon guaranteed. Buckeye paint and varnish remover saves money and also saves labor. LEAVES A NICE CLEAN SURFACE.

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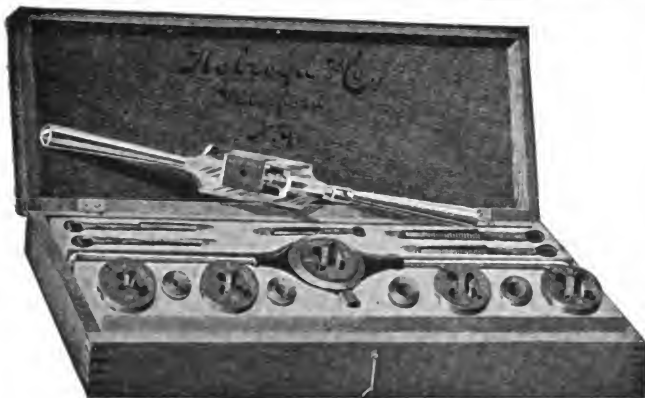
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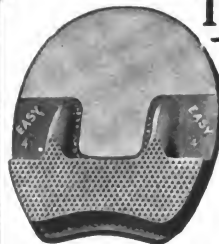
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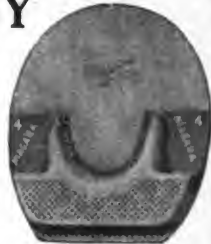
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Extra Heavy,  
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Has the Rubber  
where it is needed.  
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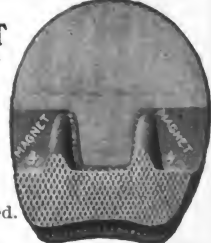
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Heavy, fully guaranteed.

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Branches at Boston, Chicago, Denver, New York, San Francisco and Los Angeles.



# THE AMERICAN BLACKSMITH

A Practical Journal of Blacksmithing and Wagonmaking

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## The Response to the Call.

Our call for at least one new subscriber from each present reader has already been heartily answered in many quarters. Some of the readers have not only sent in the one new subscriber expected from them, but have sent in clubs of four or five. And in many cases the new readers have secured other new ones. A York State smith in giving an order to send the paper to a friend says; "I have been a subscriber to THE AMERICAN BLACKSMITH for some time, and like it very much. I think it is just what my friend needs". Mr. Reader, haven't you a "friend who needs a friend"? Be a friend and order THE AMERICAN BLACKSMITH sent to him. If you presented your brother-craftsman with a dollar's worth of good cigars he would dispose of them very easily in a week. But give him THE AMERICAN BLACKSMITH for a year—same price—and it will remind him of you every month, it will enable him to do more work of a better class, and he will consider the present worth many times the original subscription cost.

But it is by no means necessary to present your neighbor with a year's subscription. Show him a copy of the

paper, tell him what it has done for you, tell him the very reasonable price and get him to sign a subscription blank. Or give him a copy of the paper and allow him to examine it at his leisure. We will gladly send sample copies free to any interested parties, and if in need of assistance, don't hesitate to ask our help. We have determined to reach the 40,000 mark and to pass it if possible. Of course you want us to reach it—then hustle with us.

## Remember Your Pink Buffaloes.

Every letter you write should bear a member of the herd. If your supply is low, a postal card is sufficient for a request for more. But don't wait until your herd is entirely depleted. If you desire a square deal, a pink buffalo on your correspondence will secure it for you. The little pink squares mean protection for you, and prompt attention for your letters. They show that you are up-to-date and progressive, that you are a customer worth having and keeping and if there is a special proposition to offer, the live smith is sure to receive the first tip. We have a large supply of these stamps and are always willing to forward new lots to any subscriber. THE AMERICAN BLACKSMITH insists upon best treatment for its readers. And while we stoutly refuse to admit unreliable and fake advertisers to our columns, we also protect our readers from the unreliable houses unable to gain admittance to our columns. Therefore, use the stamps freely, to show that you are up-to-date, progressive and enterprising. Stamp your self as a modern smith.

## The Top Round of the Ladder.

When questioned regarding his son's future, Ex-President Cleveland said: "I would rather that my boy be able to build a great structure like the Brooklyn bridge, than to receive the highest honors that the people can bestow upon him". Yet it is not so many years since a mother's and father's fondest dream was to see their son occupy the

presidential chair. The honors of a public life were emblazoned upon the young mind, and the man of the future was taught that the highest honors were to be sought in this field. That time has now practically passed, however. The industrial development of the country has been such that the rewards for the men behind the progress have almost eclipsed the honors to be gained in public life. The opportunities for men to show their mettle have been such, as to make the public life seem small, when compared with a broad career in the commercial field.

Of course the political arena has need of great men—at perhaps no other period has the country been in such urgent need of men of character and worth, and our daily papers rarely go to press without lauding the good work of this, that or the other public worker. But when we consider the true development of the country, we must with the same thought, pay homage to the great minds in the field of mechanics.

## The Smithing Craft of the Future.

The smithing craft is surely getting back to the position it once occupied. People are beginning to realize that the trade can not be successfully followed by any but live, practical smiths, and the so-called "botch" is rapidly falling to the rear in the march of progress. The day is fast coming to a close when a man can successfully pursue the craft with a cracked anvil, a leaky bellows, a pile of stones for a forge and a training worse than his tools. The farmer of to-day cannot afford to place his implements in the inadequately equipped shop whose owner is unskilled. The modern horse owner insists upon some degree of skill and knowledge in his horse shoer. And it is the modern smith, with his modern shop and his modern equipment who is reaping the reward of the day's demands.

In looking closely at the smithing craft of to-day, the young craftsman cannot help but see the bright prospects of the future. Better shops are

being built; the gas engine and dynamo are shouldering the heavy loads; labor saving machines are being installed and the value of organization is being brought to the attention of the craft. The future of the young smith who "sticks to the craft", was never brighter.

The equipment in the shop of to-day allows the smith to do more work and better work without the old time "grind" and fatigue. The blacksmith shop to-day, is not the dirty, sooty place it was several years ago. Modern tools and machinery have made it clean and bright; the air is pure and the windows allow the sunshine to stream in and lighten the burdens of the smith. Surely few trades are to be preferred.

#### **The N. W. N. A. Meeting at Chicago.**

THE NATIONAL WAGON MANUFACTURERS ASSOCIATION held a special meeting in Chicago on March 8th. The members present represented a very large portion of the aggregate farm wagon output of the country.

Special consideration was given the present conditions surrounding the material markets, especially those of timber, lumber and bent stock. These materials have greatly advanced in price since a year ago.

Since the Association has been successful in establishing standard heights

as seriously considering the manufacture of these lines alone or collectively.

The question of the cost of wagon manufacture at present compared with that of a year ago showed the increase to be largely in excess of any advance made in selling prices since that time. And individual manufacturers generally expressed opinions that not only was an increase in selling prices warranted now but that an advance in the near future was inevitable. One of the most important actions taken by the Association was the recommendation to its members and the farm wagon manufacturing fraternity generally, of a standard form of wagon warranty. The form adopted by the Association will shortly be given to the press.

The Association will probably hold an early summer meeting, although the date has not yet been fixed.

#### **The Forging Department at Farm School.**

C. H. BRADLEY.

Superintendent of Farm School.

The Farm School, located on Thompson's Island, Boston Harbor, is a private school for boys, instituted in 1814 and supported by subscriptions, donations, and bequests. Its purpose is to help needy, worthy and deserving orphan boys, receiving them between the ages of ten and fourteen. Hopelessly bad boys are not considered.

mechanical drawing, woodwork, machine work, blacksmithing, painting, printing, office work, farming, handling of boats, care of marine, steam, and gasoline engines, etc.

The choir and brass band afford opportunity for the teaching of vocal and instrumental music. "Cottage Row", a miniature city, with its various departments modelled on actual forms, furnishes practical lessons in government, politics, and business forms. The Farm School Bank and Trading Company teaches thrift, economy, and the routine of business and banking. From the printing department, besides all kinds of job printing, comes each month the "Beacon",—the school paper, published by the boys, and telling of the work in their own words.

The particular phase of industrial training that would appeal to the readers of THE AMERICAN BLACKSMITH, is that of blacksmithing and machine work. The work in metal follows and supplements the excellent course in Sloyd and practical carpentry, which each boy completes before he leaves the school. The equipment in this department consists of two Buffalo forges with fan blower attachment, four anvils and the other usual tools. There is a 12-inch standard screw cutting lathe, a milling machine, an upright drill and a double emery grinder. With



FARM SCHOOL TEACHES THE STUDENT NOT ONLY HOW TO USE THE WAGON BUT ALSO HOW TO REPAIR IT.

of wheels, thus bringing the material specifications of all wagon manufacturers into line on bent and sawed felloes, etc., several prominent manufacturers have expressed themselves

Agriculture forms the basis of the school course. With it are correlated the studies that are taken in the regular grammar school grades. Industrial training is given in various lines, as

this plant a large variety of most any kind of work can be done.

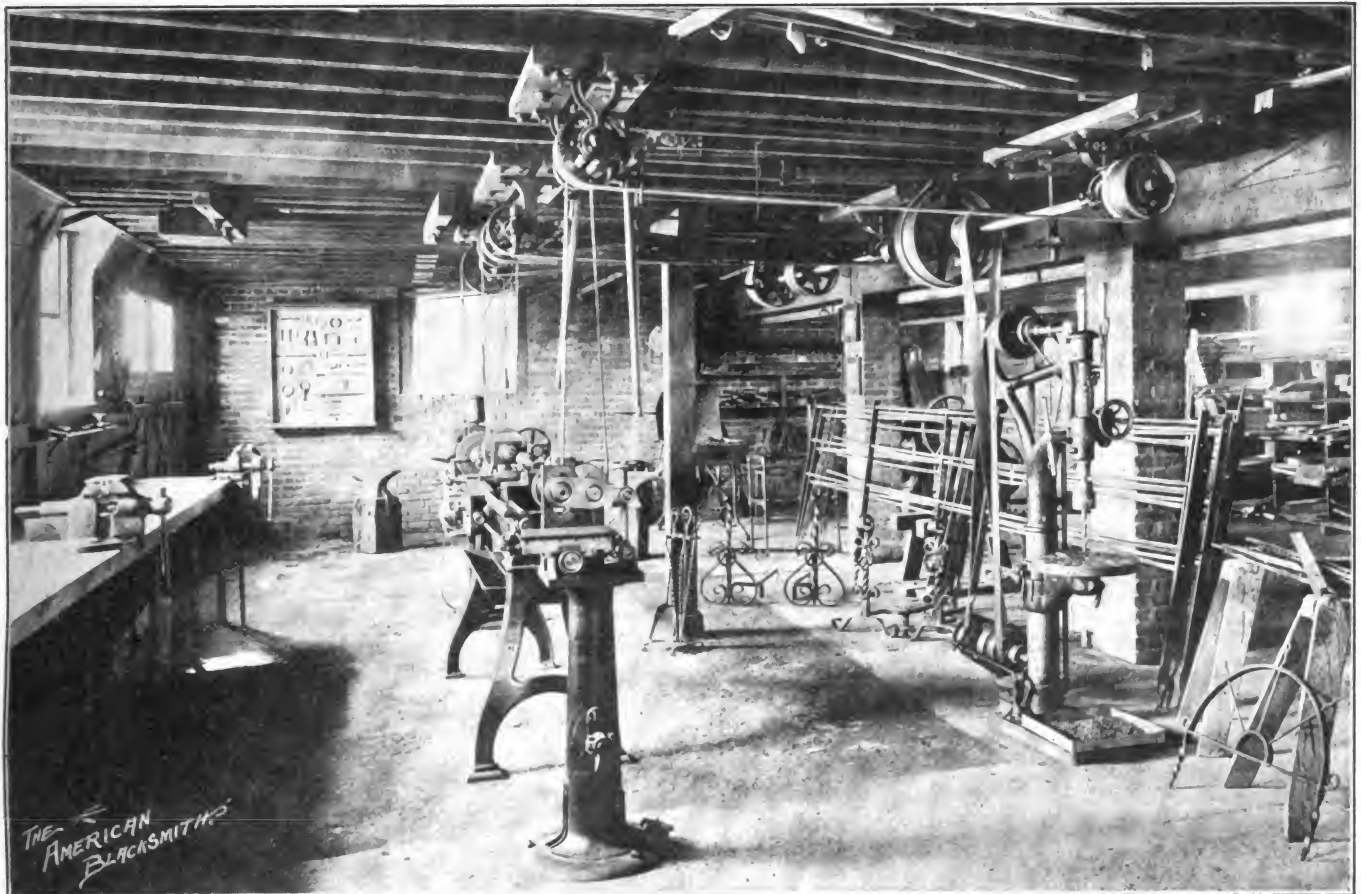
In the course in blacksmithing, the first model gives exercises in drawing and shouldering, and the later models

in bending, twisting, upsetting, making square and hexagonal heads and square corners, through the making of rings, chains, ring bolts, tongs, etc. In steel working they make the center punch, cold chisel, hammer head, springs and the steel and iron weld. Each boy works from the blue print of his model, gets out the stock and cuts it, and each piece, when completed, represents his own work in every detail. The whole course is made practical by application to the large amount of repairs and new work constantly called for on so large an estate.

The picture of the blacksmith shop shows the machines in the foreground,

this kind, when throating down, do not hold the fuller square across as you would for a side tool, but hold it to an angle of 45 degrees and have the bottom part of the tool the longer. When it is drawn out, tip the point to about the center of the tool, then when you turn the end over the horn of the anvil, it will come in line with the top of the tool and have the right clearance. Sometimes, moulding cutters for cutting wood, are brought, all finished to the shop to be tempered, and all the customer knows of the quality is that they are steel and are supposed to harden. Now, to make a sure thing, I give them the same treatment that

deep enough to mark your corners well, then heat again and turn the punch so as to divide the distance equally between the corners already made. Drive the punch again and so continue until you have the right depth. This gives eight sharp corners. To temper this wrench, heat back far enough so that a little of the shank will harden. Then plunge into the bath with shank down and hole uppermost. Remove strains, rub it up bright all over and then press a potato over the end for  $\frac{1}{4}$ -inch. The potato should be one-half inch thick around the end. Now heat a large nut or collar and draw the temper to a dark blue up as far as the potato. The part



A CONVENIENTLY ARRANGED SMITH AND MACHINE SHOP WHERE THE ARTISTIC AS WELL AS THE MECHANICAL HAND HAS A CHANCE.

with the forges at the rear. Against the rear wall is a case of models. Samples of the work done, may be seen in the sections of iron fence, the andirons, and fireplace set. The other picture shows some of the practical work done in the way of repairs. It shows a corner of the Industrial Building, looking into the blacksmith shop.

#### A Good Talk on Wood Tools.

DAYTON O. SHAW.

I remember (when an apprentice) of trying to forge a turning tool for the pattern room. In making a tool of

I do cams with the exception of drawing the temper to a dark straw after the strains have been removed. The temper may be drawn on either hot iron or in hot sand.

Another article that might cause a smith some trouble is the tempering of a piano socket-wrench. This is made in a lathe and a quarter inch hole drilled in the end to the depth of  $\frac{3}{4}$ -inch. It is then given to the smith to punch and temper. (The hole is  $\frac{1}{4}$ -inch round). I use a quarter-inch square punch. Heat the wrench and start the punch

of the shank that is not hardened, will show the same color. Next, cool it, then pull off your potato. Now, on one-half of the head of the wrench, the temper is not drawn, the other half is drawn to a dark blue. Brighten the whole head and draw to a light straw. We find now that the end of the wrench is too hard to file while at the bottom of the hole it is almost spring temper. This makes a neat looking job. The shank is dark blue while the head is a light straw color.

The careful tool-maker considers

the use to which a tool is to be put. He knows that a first-class mechanic can use a finer-edged and a higher-tempered tool than the apprentice.

### A Talk on the Credit Question and Price Cutting.

W. S. SMITH.

I have been in the smithing business for fourteen years. My shop is 32 by 40 feet, I run two fires, have one Buffalo No. 99 Blower, one Champion No. 400, one Barcus Shoeing Stock, a Mayer's Cold Tire Setter, a Little Giant set of Stocks and Dies, full mounted, ranging from  $\frac{1}{4}$  to  $\frac{7}{8}$  with a set of woodworker's tools besides a fine lot of hand tools too numerous to mention. I do all kinds of repair work and shoeing. I am always busy even through the dull season. I make neck yokes, single trees, doubletrees, hinges, wagon bolsters, tongues, harrows and many other things to sell and I always keep my shoes fitted ready to nail on so that when the rush comes I am ready for the work. In this way I can keep busy all the time. I have a large trade and do a lot of credit work and sometimes wait a long time for my pay. I feel that something should be done to protect the mechanics, but don't know what would be the best way to proceed. I think organization would be the proper thing but that is hard to do. It would be an easy matter to organize good mechanics but we have so many "botches" to contend with, who have been plugging a long time with an old cracked anvil and a leaky bellows cutting prices and just keeping soul and body together, who would not organize or do anything that is fair or manlike. Some may say that such a man is not in the way of a good smith but you just try to keep your prices up and you will see. I have had men that were good pay take their work to one of those cobblers in order to save 50 cents on a 5 dollar job. While there are a few customers that look at the quality of the work instead of the price, a great many don't consider quality at all. A great many seem to think that a blacksmith don't need any money. They will try to sell him a few potatoes or do a little hauling for you or sell some refused stuff that they can't sell at a store and charge you all they can get. I handle shelf hardware for a side line and when they buy any they most always pay for it but if they have work done, nine times out of ten, they will ask for credit. This is very strange to me. Why don't they appreciate hard work and the material you use as well

as goods they buy from a merchant? Something is wrong, but just what it is I am not able to say. If we can bring about something to require the smith to qualify himself before he can set up a shop I think it will be the thing to do. I have been reading articles in THE AMERICAN BLACKSMITH treating on this same subject and I can realize how they feel. I have gained a great deal of information through the journal and would like to hear from others who have never written. They all certainly know something that would be of value and interest to the craft.

### Quarry and Mill Operations.

J. C. LAMON.

For the benefit of the readers of THE AMERICAN BLACKSMITH who have never seen a quarry, I will also endeavor to tell what part the blacksmith plays in the producing of Oolitic Stone. The jobs



MADE POSSIBLE BY THE CO-OPERATION OF THE BLACKSMITH.

for the smith around a quarry and mill, are almost limitless so I shall describe a few of the important things a smith does in this field and give a sketch of Indiana Oolitic or Bedford stone.

Oolitic limestone occurs in commercial quantities in Monroe, Owen and Lawrence Counties, Indiana, where extensive operations are carried on. There are over 3500 persons engaged in its production at the present time. In addition to the vast amount used in this country, considerable of this stone has found its way into foreign lands on account of its adaptability for general use. Aside from this it can be quarried in immense blocks and its free stone nature makes it especially favorable for both cutting and carving. This stone occurs only in buff or blue either of which color is particularly attractive for architectural use.

The modern method of quarrying and the manufacture of special planers, headers, lathes and saws for finishing the stone can be produced in any size

to the utmost limits of transportation. In quarrying the stone a channeller machine is used, which has revolutionized the quarry business and has made it possible to quarry the stone in any size and at a very low cost. This machine is nothing more than a steam drill but much more elaborate of course. It is mounted on a carriage which runs on a track, the machine automatically propelling itself as it strikes each blow. The machine, instead of using one steel like a steam drill, has several steels in each set. The steels are made of stock  $\frac{3}{4}$  by  $1\frac{1}{2}$ -inch square and range in different lengths increasing by steps of 15 inches to any depth desired to channel. A set of steels consist of five to each length, five steels of the same length being clamped in the machine at once. Each steel is forged somewhat like a cold chisel except 2 of each set which are called diagonals. They are forged diagonally so when the set is clamped in the machine ready for running they cut a square groove in the stone. The stone is channeled by these machines in any size and the blocks are removed by powerful derricks. Of course these steels frequently break and this gives the smith lots of practice in welding steel. The male and female scarf is usually employed and any good welding compound used. Now after the stone is quarried and hoisted out of the hole it is ready for the mill or some of it is scabbed—loaded on cars and shipped to the various markets in the rough.

Mill operations consist of taking the rough blocks of stone and finishing them ready for setting in the building or other structure. The stone is sawed in various sizes by gang saws. These machines are usually built as follows; a square frame is suspended at its four corners by rods in such a manner as to be oscillated by a pitman and crank motion. The saw blades are firmly clamped between the "cross heads" at each end, the saws do not have teeth as one would naturally suppose but are nothing more than pieces of steel  $\frac{3}{4}$ -inch and from 12 to 18 feet long. The huge blocks of stone are loaded on a truck and run under the saw frame. The saws may be set to any gauge desired. A continuous stream of water mixed with sand is kept pouring on the saws all the time. This is done by a "sand pump" which is a novel machine in itself. It consists of a large drum with an opening to dip up the water. This drum is separated into compartments on the principle of an endless screw which forces the water from its



mouth to the center where it is conveyed in pipes to the "gangs". The gangs cut from 5 to 12 inches per hour. The stone is also sawed by an endless wire cable driven at a moderate speed. It feeds itself by gravity.

Stone is also planed and turned in any shape by a specially constructed planer which operates similar to the regular machine shop pattern, except that it has four or more tool heads. Making the necessary tools for a planer is an important job and much care is required in tempering them. They are forged from stock from 1 by 1½ to 1 by 12 inches, the size depending on the nature of the work, each mold requiring a special shaped tool. The molding tools are forged to an exact pattern, the pattern being made of sheet iron by the draughtsman.

Now as any two buildings are seldom alike, there are seldom or never, two molds alike. So when one job is completed the tools are worked over into other patterns. The molding tools are forged to the required thickness and then the metal pattern is placed on the back side. The tool is then marked out, heated and cut out. Next it is ground on the emery wheel until it fits the pattern. The tool is now tried to the pattern and is touched up with a file and tempered. The smooth bits are "roughing out tools" made of stock usually from 1 by 4 to 1 by 16 inches and are bent to an angle of about 45 degrees. They are then ground in an automatic grinding machine. The way they are tempered is to heat to a dull red and cool in soft water. They seldom if ever break.

### Color-Varnish—Its Importance to the Jobbing Shop Painter.

M. C. HILLICK.

To the jobbing shop painter color-varnish, or varnish carrying a percentage of color in it, is clearly an indispensable material. It is frequently asked why the color may not be used separately from the varnish with quite as satisfactory results. By far the larger part of coach colors are enriched and given additional brilliancy of tone by adding a sufficient quantity of varnish to cause them to dry with a good gloss—the transparent nature of the coating serving to reflect the real beauty of the color. Black varnish is the most common color-varnish known to the carriage painter, and it is largely through the excellent results obtained with this material that induced experiments with other colors in varnish. It is now possible to ob-

tain a very fine grade of black varnish, and also other colors, direct of the manufacturers, but a majority of jobbing shop painters prefer to mix their own color-varnish, suiting ingredients, proportions, etc., to their individual requirements. In preparing color-varnish it is good practice to break the color up with a little varnish, gradually adding the varnish until the color becomes thoroughly soft and mixable. Then into a varnish can large enough to accommodate your needs, pour the proper proportion of varnish, last adding the soft pigment. Then shake thoroughly until a smooth, compact, semi-liquid material results. Shake the contents of the can repeatedly during the day until a perfect mixture of the parts is obtained. In preparing, avoid too much color.



THE STONE CAN BE PRODUCED IN ANY SIZE.

Remember that a true color-varnish should be, highly transparent; that only enough pigment is needed to furnish the material an atom of color and a mass of varnish.

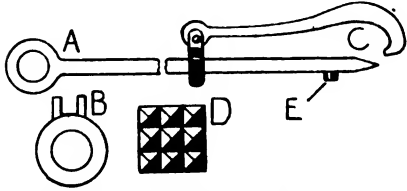
A distinction, of course, should be made between treating what is known as solid color and transparent or semi-transparent colors. For example, carmine, perhaps the finest toned pigment used in carriage painting, is an unusually transparent pigment. This pigment is never used over any but a perfect ground—a color, in fact, almost identical in its flat or dry condition with carmine—and its mission as a glaze coat is simply to enrich and give additional brilliancy to the ground color, for which purpose comparatively little pigment in proportion to varnish is used—say from ¼ to ¾ ounce of carmine to a pint of elastic rubbing varnish. This proportion of black for a first coat color-varnish would be altogether too small, for the black as a first coat material is supposed to make up some of the existing deficiency of the ground color, especially in giving it needed capacity, whereas the carmine necessitates a perfect ground to which it imparts no further opacity, but simply

increased richness and brilliancy. So in like manner are used many of the rare and costly lakes. They require grounds densely opaque because they have no opaqueness in themselves, and are used first, last and all the time, as enriching coats. Such pigments, therefore, like carmine, should be used sparingly in proportion to the quantity of varnish employed. The lakes which are to be used in small quantities, in proportion to the quantity of varnish, like carmine, are scarlet, carriage part, Chatamuc, Brilliant, English Crimson, English Scarlet, English Rose, English Yellow, English Purple, Geranium, Maroon Munich and Madder Lake, Verdigris Glaze, either American or French, green lake glaze etc. These lakes and glazes, as above stated, require grounds brought up to a practically perfect condition both as to opaqueness and freedom from defects. Of the wine colors proper, it may be stated that like the blacks or the greens or even the reds and yellows, a larger quantity of pigment, in proportion to varnish, should be used, perhaps double the quantity used of carmine or lake, this, of course, depending upon the strength of the pigment.

In the production of green surfaces which are immensely popular, the practice in fine city shops is to bring the surface up in the flat color, then to apply green color-varnish, rubbing this lightly with a sponge moistened with water and powdered with No. 00 pumice stone. This reduces the gloss and smooths off the atoms of dirt, if any, without cutting into the color-varnish. The surface is then washed very clean and glazed with yellow lake, or with verdigris, as the shade of green desired, may indicate. The jobbing shop painter in the country town or village may not have many of these strictly high-class jobs to do, but it is of value to know how to proceed when the occasion arises. By getting a strong solid green and then applying a green color-varnish, flowing the coat on freely, and using a dash of the green in the subsequent rubbing coat of varnish a very fine, medium cost green surface will result.

For a medium cost blue surface, first apply a coat of lamp black, and upon this ground lay a coat of ultra-marine blue of whatever shade desired, beaten and thoroughly incorporated with an elastic rubbing varnish to better facilitate flowing the color-varnish upon the surface. Possibly after lightly rubbing this coat it may be found necessary to flow a second coat of the color-varnish in which reduce the quality of color

somewhat, thus making the coat to serve in the capacity of both a color-varnish and an actual rubbing varnish coat—a sort of killing two birds with one stone practice. For a strictly high-class job of blue color-varnishing, bring the surface up fine and smooth and lay on, as already stated, a coat of lampblack mixed to dry flat. When dry and ready



A HANDY HOLDER FOR PLOW BOLTS.

to work over, dust off and apply a coat of coach body blue, to be obtained in three shades, this blue to carry a teaspoonful of elastic rubbing varnish to a pint of the pigment in semi-paste form. Brush this coat on fine and uniform with a 2-inch camel's hair brush, and, *keep the surface clean*. Next mix enough of the ultra-marine blue in elastic rubbing varnish to suffice for two coats of the color-varnish or glaze. Use, say, 1 ounce of the blue to a pint of varnish, and in case the blue is of less than normal coloring and covering power increase the quantity of blue by  $\frac{1}{4}$  or  $\frac{1}{2}$  ounce—individual judgment must, to some extent, govern this. Use a soft, half elastic bristle, 2½-inch brush for laying this color-varnish upon the large panels, a 1-inch badger-hair being a good tool to work around mouldings and panel edges etc., and for wiping up. Give the first coat of blue color-varnish a light sponge rub with water and No. 00 pulverized pumice stone. Wash up and flow the second coat of color-varnish, or glaze, as it is variously called. A blue surface brought up in this way is expensive but very beautiful.

In using red color-varnish—there are, at least, five dozen different kinds of red—the ground color does not have to be as perfectly solid in the matter of color as the blues or the greens or the lakes, for, as a rule, the common run of red pigments such as coach red, American red, coaching red, and so on, are stronger coloring pigments, and possibly not quite so sensitive in other respects as the semi-transparent colors. At the same time, the grounds for these colors should be brought up very clean and fine. Then lay a coat of the color mixed to dry flat, without gloss. Use a tablespoonful of elastic rubbing varnish in a full pint of the semi-paste, and then thin with turpentine. For the

color-varnish to be flowed over this coat add to the varnish enough pigment to give the mixture some body and plenty of gloss. For the best grade of work, use a second coat of the color-varnish, diminishing the quantity of pigment and increasing the flow of varnish. This will increase the brilliancy of the color and give it a depth of lustre greater than can be had with a single coat. With the yellow pigments exceedingly smooth, clean, solid surfaces are necessary to obtain which the various coatings from the foundation are to be laid and brought out very carefully and skillfully. For the yellow, start with a first coat of pine white and from the white gradually work up to the exact yellow desired. For a good, thorough job lay two coats of white. Make the third coat, say, half white and half the yellow desired. Follow in due time with a full yellow coat mixed with a binder of varnish and thinned with turpentine. Then, to the elastic rubbing varnish, add enough pigment to give a good, strong color-varnish, but one that shows a very high gloss. The strength of the color, which varies with different makes, will determine the quantity of pigment to be used. Too much pigment will make the yellow look dull and without life.

Browns, generally speaking, are solid colors, if we except the siennas and umbers, but like the reds, they should have fine, solid grounds without flaw or defect. Then a coat of the final color, mixed to dry flat, should be applied. Then for a first-class job apply two coats of the color-varnish, the last coat carrying considerably less color than the first and both coats having only enough color to perfect the ground and enrich the surface. What we have said in respect to the browns may with equal force be said of the black-color-varnish, which because it is really black, is by a very large number of carriage painters preferred to black japan.

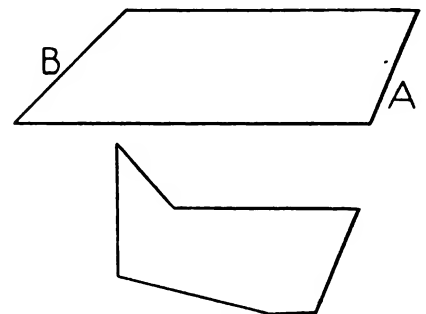
In using white-color-varnish upon good work, mix Florence or flake white in hard drying or elastic finishing varnish, as the time allowance may control, adding merely enough of the white to kill the "yellowing" power of the varnish and to maintain an absolutely white job. The ground for the white should be solid white, and quite free from defects, as it will be found impossible to remedy a defect in the surface after the surface has been wrought up to the color varnishing stage. Another practice of handling white color-varnish, over a ground brought up without defects, consists of adding  $\frac{1}{2}$  pint of wearing

body varnish to 5 lbs. of the finest quality of white keg lead, then thinning the mass with turpentine and straining. This will not make a high lustre color-varnish, but rather one of a little above an egg shell gloss. Five coats of this mixture is applied in five successive days no rubbing and sandpapering being done between coats. These coats, mixed to all dry alike, are now allowed to stand a week, after which they are rubbed with pulverized pumice stone and water, then cleaned up and varnished with one coat of colorless varnish.

### A Very Handy Plow-Bolt Holder.

C. W. METCALF.

This bolt holder is self-adjusting and is very easily made. I have used one for the past twenty years and have yet to find a bolt I cannot remove with its aid. To make one, take a piece of  $\frac{3}{4}$ -inch bar steel about 20 inches long and flatten one end, punch a hole and forge a neat eye as shown at A in the engraving. Then make the slide B. This is made by forging the block solid and then drilling the hole  $\frac{1}{8}$  of an inch larger than the rod. This will allow the slide to move easily along the rod and to grasp it tightly when pressure is applied. Now forge the hook C, from good steel and after drilling a hole in the hook, as shown, and a corresponding hole in



PLOW POINTS FOR REPAIRING OLD PLOWS

the two branches on the slide, bolt the two together so they will work freely. Now drill a  $\frac{1}{8}$ -inch hole in the end of rod at E, heat the rod and drive the stub of a spike into this hole so as to leave a short square of the spike protruding. Now file this stub with a three cornered file so as to make sharp teeth as shown at D and temper. Your bolt holder is now ready for business and it will never fail on the most persistent bolt.

### Plow Points for Repairing Old Plows.

THE MISSOURI KID.

I make all my own plow points. The stock I use is 1½ by  $\frac{3}{4}$ -inch plow steel or an old horseshoe rasp which will an-

swer the same purpose. The point I make is called the "Duck Bill". It is a double point. I cut my stock  $8\frac{1}{2}$ -inches long, the full length as shown in Fig. 1, cut the iron on a bevel as shown at A, cutting B, the opposite way as shown. Then draw A, to a feather edge on the side that comes on the share. Our plows are all left hand ones. Now draw the end B, and bend as shown in Fig. 2. Now bend it in the center over the horn of the anvil and see that the edges are square and opposite one another. The straight end comes on the top of the share while the bent end comes underneath. The lip will extend on to the wing of the share while the curve runs with the shape of the share. Now take the share that is to be repointed, dress up the old point smooth, stock on the point and take a piece of old wagon tire-iron about 9 inches long and bend it the flat way. Now lay it on the plow share and let it extend on to the point. As it is curved you can now put on your tongs, slipping a ring on your tong handle and spring it together so it will stay in place long enough for the first heat. Now weld up solidly over all and hammer out to shape. Dress up and you will have a good job and a point that will answer its purpose. It takes me somewhat longer to put this point on than the factory point, but I guarantee a satisfactory job. I cannot put this point on in twenty minutes as our brother, Mr. McCoy, does.

### On Vehicle Painting in the Jobbing Shop.

A. J. YEAGER.

In the first place I have to take sides with Mr. Larue, he says: "If run on scientific principles," and then he tells what those are by painting a buggy for \$5.50, and says that there is a profit in it at that price. Now, I have run my business for thirty years and have had all kinds of mechanics working for me, but I have yet to see the man who can paint a buggy with an expense of \$2.00 for labor. And I cannot furnish shop room and paint for \$1.50 per buggy, as Mr. Larue says he can. He says, he has painted 18 buggies this season at the prices he names and has made a profit out of them of \$36.00, or \$2.00 per job.

I give my prices for painting buggies: Open jobs from \$10.00 to \$12.00; top jobs from \$12.00 to \$20.00; two seated jobs without tops, \$15.00 and up; with tops, \$18.00 and up; drays and delivery wagons of the large sizes including lettering from \$20.00 up; and I find that it

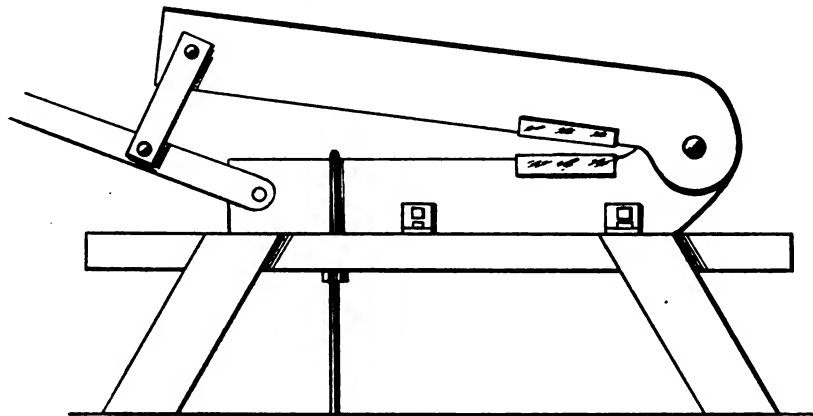
keeps me busy to make ends meet at those prices; I also run a general repair shop, including wood work and rubber tires, with my paint shop, but I want to say that we do not do the kind of work that Mr. Larue does. All of our jobs when they leave our shop look as good as if they were new, and I think as far as the painting goes, it is better than they had when they were turned out of the factory. We use Valentines Varnishes and all of our colors are ground in oil or japan, and

In short, the successfully conducted paint shop is a matter of management rather than materials.

### A Home-made Cutting Shear.

J. G. CLOWER, JR.

The shear illustrated herewith is very handy, simple in construction and took me not more than two hours to make at a very small cost. The stand or bench is made of 4 by 6-inch oak lumber and is similar to a common



A PRACTICAL CUTTING SHEAR FOR SHOP USE.

are mostly of Valentines make. I pay my painter 25 cents for every hour he works, whether he puts in 5 hours or 20 hours in a day.

Beginning about this time of the year, I have two and sometimes three men in the paint shop, I keep one blacksmith all the time and sometimes have two, I doing the woodwork and the mounting of rubber tires myself. My shop is 22 by 50, on a good business street, and has a regular store front which gives us good light and good ventilation. We use two Royal forges.

I have a separate building away from all dust and smoke, with plenty of light and water handy, where I do my painting. I furnish my painter with plenty of good brushes and plenty of sand paper and good chamois and sponges, and always have all kinds of paints and colors, so that he is not troubled about mixing up any color he might want. At the same time I watch that he does not waste anything nor let any paint stand in the cans unused to dry up and go to waste. For those are the leaks for the profit, if allowed to be so. I can say that my paint shop pays, and pays better than if I were doing a lot of cheap work, such as Mr. Larue tells about doing. I never was any good at cheap work. I want a job well done, and if I am not allowed to do it well, I refuse to do it at all.

work truss. The bench is four feet long. Then I secured two cutter-bars from an old reaper and bent the end of one up and the end of the other down. I then riveted the bent ends together with a good stout rivet. The lever or handle is of 1 by  $\frac{1}{2}$ -inch stock and is 4 feet long. One end of this piece is split so as to evenly distribute the strain on the rivet by which the lever is hinged to the lower blade or jaw. About five inches from the split end another hole is drilled. Now cut two pieces of stock, 1 by  $\frac{1}{2}$  by 6 inches long, drill a hole in each end of the two pieces and rivet one on each side of the upper blade or jaw, connecting them in turn to the lever or handle. The lower jaw is fastened to the bench or stand with two or four brackets. One or two, as the case may be, on each side of the jaw and firmly bolted to the wood base. Now, after forging a hook on the end of a piece of  $\frac{1}{2}$ -inch round stock, run the straight end down through the bench, hook the other end over the top edge of the lower jaw and bolt firmly to the floor. This will hold the shear firm and rigid. Of course this tool can be made to shear and cut any work, but I can cut flat stock,  $\frac{1}{2}$  by 3 inches or  $\frac{1}{2}$ -inch round rods.

The modern general shop is hardly complete without a good cutting shear and the foregoing plan and explanation

makes it possible for every smith to make a good serviceable shear at very small cost. Would like to hear from any brother smith having a better home-made shear.

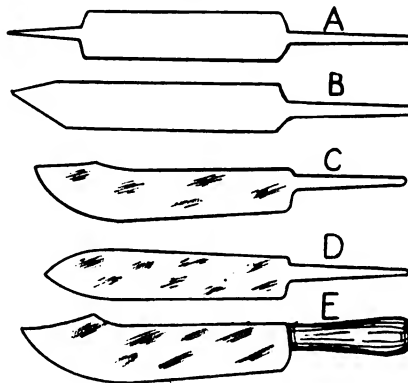
### Unfair Catalogue Houses.

W. S. SMITH.

I will mention a few points concerning certain catalogue houses. No doubt a great many of you blacksmiths and horseshoers are familiar with the way some firms sell goods, for they are very numerous in Chicago and other large cities. They send out catalogues quoting all kinds of goods at net prices. They will sell you anything from a paper of pins to a threshing machine. They send their catalogue to all the farmers in the country, soliciting their trade. They advertise like this: "Buy your own tools, sharpen your own plows, shoe your own horse, save your blacksmith bills. You are paying too much for your repairing." They tell the farmers that the merchant is charging them too much for their goods. They say they have no salaried men to canvass for them therefore have no traveling expenses to pay. Then this same house sends the blacksmith a catalogue, asking him to buy his supplies from them. They will tell you just what you are paying for your horseshoes and probably offer them to you at a trifle less than you are paying. This—for an inducement in order to get you on something else; at the same time breaking down your business. If such things continue, every farmer and every livery man will be his own blacksmith and his own merchant. What will become of our towns, and our business men? While the farmer cannot get along without the blacksmith and merchant, he can't afford to send to his catalogue house for all his needs. He cannot do entirely without the blacksmith, as he has repair work which he cannot do himself, while at the same time, he is crowding the blacksmith out of business.

In the place where I am running a shop, the farmers know just what my supplies cost me. They will sometimes go so far as to figure out and tell me, just what my profit is on certain pieces of work. They don't stop to think that I must have a living, and pay for the wear on my tools, and the expenses of new and up-to-date tools. What would you think Mr. Blacksmith, if your iron drummer would sell you a bill of goods and then go to your customers and offer to supply them with the same goods at the same prices?

Why, you would kick him out the next time he came in your shop. This is just what certain catalogue houses are doing to you. If you are buying goods from any such house, my advice is to cut it out at once. You are supporting a concern that is putting you out of business, while the legitimate business houses are protecting you, and building up your towns. In the first place these catalogue houses do not put out reliable goods. Their goods are not branded as a general rule, excepting an unknown brand. If you order tools of them, you may get a good tool and you may not. More likely you will get a cheap tool that will not give satisfaction, while on the other hand, if you buy from reliable houses, you are most sure to get reliable goods. Reliable manufacturers will not sell to



MANY SMITHS FIND THEM A PROFITABLE SIDE-LINE.

these houses, because they want to protect their customers, which is just and right. I feel that something must be done, it is time for the blacksmith to wake up and get to doing something to bring about a change. I am indeed glad that we have such a paper as *THE AMERICAN BLACKSMITH*, through which we can discuss such questions, and probably bring about a change. I have been a reader of *THE AMERICAN BLACKSMITH* since its first issue, and could not afford to miss one copy. Now then let some one else take up this subject, and give us some of his views.

### How to Make and Temper Butcher Knives.

GEORGE NABLO.

I use 8-inch worn out files and have no trouble to get them from parties who have no use for them. To begin with, I heat the file to a low red all over. This prevents breaking at one end while forging at the other. I begin to forge an end  $4\frac{1}{2}$  inches to about  $\frac{3}{4}$  square for the handle, A, in the engraving, on the front end of file. Reversing the

file I cut off the old tang and forge as shown at B. I now draw the edge. This will curve the knife a little too much, but I then hammer it back. This will bring it the right shape when the whole blade can be thinned as much as desired. If file is not overheated while forging, heavy blows will not hurt it. I complete forging in about 5 minutes. When the blade is cooled, file the edge and back to shape, then file the edge to a feather edge and proceed to temper. I have done tempering in water and in oil, but was never sure of having the right temper, besides I always had much trouble with cracking or warping. With my present method, I have overcome all that and have a monopoly of the trade in that locality, none of my brother smiths being able to produce the handsome thin-bladed knife which I make.

Now, as to tempering, take a box about 12 by 5 by 3 inches deep and fill it with sand. Wet the sand thoroughly and pound it solid. Now take the knife and with edge down, imbed it horizontally whole width of blade edge-wise. Now remove it carefully. Next heat the blade evenly to a high red color and place it quickly in the impression in the sand, pressing the sand with fingers firmly against both sides of blade. As soon as the back of the blade looks blue, remove and cool in water. The blade will now be too hard. To draw the temper pass the blade over the fire until a millsaw file will begin to cut on it. Then cool it off and the blade is finely tempered.

A knife for general work is shown at C, a knife for sticking shown at D, and at E, a knife with handle complete. Apple tree limbs, when dry, make the best handles. I cut them to proper lengths, bore hole and drive on within one half inch of blade. Then dress the handle to shape and use melted babbit metal for the front finish, wrapping heavy paper tightly around the handle to hold and mold the metal.

### A Talk on Oil Furnaces.

JOHN MCMAALLY.

The subject of burning oil, particularly as applied to the railroad smithshop, has received a vast amount of attention during the past few years. And today oil can be installed in any shop and for any class of work, with a certainty of simplifying the heating facilities, greatly increasing the output and decreasing the costs accordingly.

The important points to consider have been quality and quantity of heat.



possible production, cost and best method of producing and what should, but has not always been considered, the conditions to which the furnace men are subjected in handling the material to be heated.

Crude petroleum or fuel oil, which is commonly used, has a very high heating efficiency containing from 20 to 22 thousand heat units per pound as compared with from 12 to 14 thousand in coal. It is capable of practically perfect combustion leaving no ash and when properly handled producing no smoke. The quality of the heat is as satisfactory as coal or coke, if generated in the proper manner.

The mere act of burning oil is a simple one, but the burning of oil and producing a proper flame is a very particular process. Atomizing the oil with air or steam under high pressure through variously constructed burners and burning the mixture by depending upon the heat of the furnace to keep up the combustion, is a method commonly followed. This process necessitates forcing unconsumed oil, no matter how thoroughly atomized, into the furnace. Combustion does not begin until this part of the operation has been performed and the atomized oil has been spread over the heating area and surfaces of the furnace, before burning. Again, this high pressure or atomizer system almost invariably produces an oxidizing flame, resulting in the burning of the material. Bridge walls and other arrangements, help the combustion somewhat but do not overcome the oxidizing flame.

The objections to the atomizer system were appreciated back in the early 90's by a brother railroad man. He eliminated the expensive compressed air and substituted the ordinary low pressure fan blast used in our open forges, on the theory that volume and not pressure was necessary for the successful burning of oil. With a low pressure of only a few ounces, he fortunately could not successfully atomize, so was obliged to work on other lines, resulting in a process which first burned the oil in a small amount of air.

This process resulted in a very perfect combustion of the oil at a low cost of operation and supplied a soft, dry heat to the furnaces.

Other low pressure processes discharging a mixture of oil and air into a combustion chamber or furnace direct are an improvement on the high pressure system, but do not as completely burn the oil, owing to the difficulty of supplying a sufficient quantity of oxygen at a single point and this results in a damp, oxidizing flame.

The percentage of loss, due to radiation is often high, but with proper construction of furnace it can be made a small item. With perfect combustion, stacks are not necessary and a great loss of heat can be prevented by not using them. A pound of oil contains a given amount of heat, all of which is made available with perfect combustion, but a poorly designed and constructed furnace, even if it is apparently doing satisfactory work, may be losing enough of this heat to make

quantity of material turned out is greatly increased. All of these results make better looking costs sheets—the key to a successfully operated shop.

### A Well Equipped Shop for General Work.

The accompanying illustration shows the shop of the Excelsior Wagon Co. of Hopkinton, N. Y. Speaking of their equipment Mr. A. W. Phillips says: "We have a 10 H. P. Staer Gasoline Engine. Have had it about 6 years. We also have a 24-inch surface planer; a buzz planer; a 30-inch band saw; a 22-inch circular double headed shaper; an iron lathe; a wood lathe; an automatic wood lathe; a knife grinder and emery wheel; a power drill; an iron shears etc. Our shop is 45 by 56 feet with two lumber sheds; one 20 by 30 and the other 16 by 38. We just built an engine room with cement floor and concrete sides and ceiling to make it frost proof, if possible. We make few wagons, but do a great deal of repair work. We are now at work on 20 pairs of heavy sleds. We also make ladders, stone boats, and wheel barrows and do all kinds of repairing and horseshoeing. We would say to those who are now using the old "arm-strong" power that they are away behind. Life is too short for that kind of power. A good gasoline engine and a few machines are cheaper and better than man power.



A BUSY YORK STATE GENERAL SHOP.

the cost of the operation prohibitive.

Comparative costs of coal and coke fuels depend upon locality. With properly constructed and operated oil furnaces the fuel bill can be much higher than coal or coke, and still the cost of the work produced, be materially lower. This is due to the greatly increased output, the greater intensity of the heat, the elimination in tending fires, the short time required to bring oil furnace to desired working temperature and the improved condition under which the furnace men work.

The maintaining of an even heat of any desired temperature is assured with an oil furnace. The quality of work is of a higher grade and the

Our first shop, 30 by 32, was built in 1894 and we have been adding on until now we have no more land to build on. We use the tire wheel and cut the rivets in a Sarven wheel. It's the only proper way. We have a neighbor, an old wheelwright, who does not cut them and the consequences are his wheels do not stand. We keep one man, the horse-shoer, all the time and the man at wood work about half the time. I find it hard to get competent men. If we get a good workman he has the drink habit and that spoils him for us. We have had five in the last year. We have electric light in our shop and find it a great convenience. We think of putting in a 3 or 4 H. P. engine for our light work.

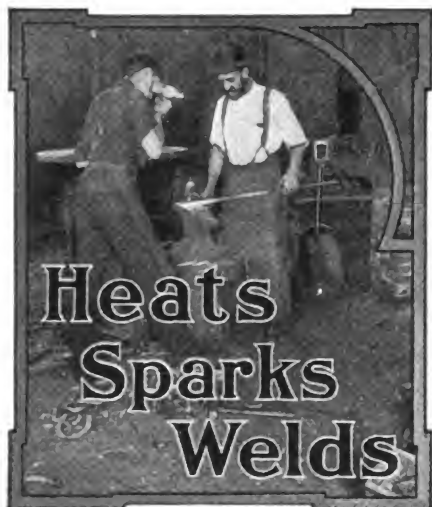
## Do Your Best.

ANONYMOUS.

If you cannot on the ocean,  
Sail among the swiftest fleet—  
Rocking on the highest billows,  
Laughing at the storms you meet—  
You can stand among the sailors,  
Anchored yet within the bay;  
You can lend a hand to help them,  
As they launch their boats away.

If you are too weak to journey  
Up the mountains steep and high,  
You can stand within the valley,  
While the multitudes go by.  
You can chant in happy measure  
As they slowly pass along,  
Though they may forget the singer,  
They will not forget the song.

If you have not gold and silver  
Ever ready to command—  
If you cannot towards the needy  
Reach an ever-open hand—  
You can visit the afflicted,  
O'er the erring you can weep:  
You can be a healthful neighbor,  
Eager Love's behests to keep.



Care never stripped the threads off a bolt or nut.

Ten o'clock rising never produced eight o'clock business.

Carefully plan your work, then thoroughly work your plan.

The man who grips his tools to suit the pay will never own a shop.

The smith who keeps no accounts is usually a no-'count smith.

Patience in business is all right, but don't allow it to become paralysis.

Not very long to fly time—the purchase of a good pair of horse stocks is in order.

Don't condemn it until you are positive that you followed directions to the letter.

When the world looks gloomy, don't try to cheer it up by whistling a funeral march.

"Because father did" is no reason. You are living in a different age among different people.

"Everyone has his hobby" said Tom, when asked why he went fishing at such a busy time.

This summer the Keystone Driller Company, Beaver Falls, Pa., propose to erect a large two-story blacksmith shop. The building is to be constructed of iron and concrete, roofed with slate.

Some smiths "hum and haw" about poor business while others find a remedy in advertising.

Hustle for new business by holding the old. Everybody likes to do business with a growing firm.

Go carefully over the gas engine just before each run. It will run more cheerfully if clean and bright.

Nine secrets to success are there. The first is work—the other eight, keeping everlastingly at the first.

Ever try a round file and a monkey wrench as a pipe-wrench? It answers admirably in an emergency.

Hustle while awaiting your opportunity. The man who sits down while waiting never has a comfortable seat.

A good time to paint the shop is now. No flies or dust to interfere and a bit of paint is a good investment.

It's a good thing to know how to get out of a tight place, but a hundred per cent. better to know how not to get in.

When asked how he established his credit, Thornton said, "I pay promptly, and collect as I pay, rather than pay as I collect."

It costs more to re-build a business than to make one. Put forth every energy to keep trade, then pay as much attention to getting new.

How long will it be before you contribute something to these columns? Over 45 smiths have contributed ideas to this month's paper.

A morning's mail of a few days ago contained letters from a justice of peace, a minister, a county auditor and an alderman. All blacksmiths, too.

A white glove often conceals a dirty hand and a bit of paint will cover many defects, but good, honest, work in carriage or wagon will always pay.

Secured that one new subscriber yet? We count on one from each present reader. Call on your neighbor smith and talk AMERICAN BLACKSMITH to him.

Just a minute—that's all the time it will take to show a copy of THE AMERICAN BLACKSMITH to your neighbor and secure his subscription. Do it today—now.

The world wants men who look upon their present positions as a means to something higher. He is too small for his present job who looks for nothing better.

With pneumatic hammers, two men and one heater average 500 rivets in ten hours, while by hand, 250 rivets a day is considered good for three men and one heater.

Write for the agency of some standard article if you can possibly devote any time to it—most smiths can. A good side line will pay you well for the time spent.

"I want some more", cry many of the shops we have seen lately. And a good many signs are also in need of paint. Of course, your shop and sign is well painted by this time.

In China, the egg that has "improved with age" is considered a delicacy and, we are told, that the well-to-do pay high prices for a real good old egg that has had time to mature.

Like a two edged sword—that Honest Dealings paragraph works both ways. It means fair treatment for readers by advertisers and the same for advertisers by readers.

The successful smith must be a business man, and the successful business man must be an advertiser. Apply several good thick coats of advertising paint to your business house this spring.

To make a start for better things, get the boys together and talk over prices and things. See if they don't realize the need of organization. Far better to hang together than to hang alone.

How do you treat your files. Throw one on top of another—use a good one on soft and rabbit metal—use them on rough castings or scale? They will repay you well for reasonably good care.

Of course he had to quit. When we questioned him he admitted that most of his customers had owed him for years. Collections must be looked after—no business can prosper on the money outstanding.

Surely he can afford to give one dollar for a years subscription. Tell him about the good, practical, interesting shop information contained in your favorite journal each month—tell him of what benefit it is to you. Remember you get six months credit for each new subscriber.

Tell your neighbor if the paper pleases you—if it doesn't, tell us. If you feel that you have grounds for a complaint, report to us direct. We would rather straighten out a hundred "kicks" than to have one member of our large AMERICAN BLACKSMITH family remain silent regarding his trouble. Give us a chance to "fix it."

As well expect a continuous flow of business from the occasional advertisement in the local weekly, as to expect a goodheating fire from the occasional turn at the blower. The time to advertise is all the time. By no means is it necessary to advertise continuously in any one manner. Keep your eyes wide open for opportunities as presented by fairs, meetings, picnics, etc. But keep everlastingly at it in one way or another.

The air of a large Pittsburg office building is being washed before it is put in circulation. An excellent plan for the smith-shops, with old smoky forges. Of course, you have a good modern forge, pure clean air and plenty of light and sunshine. There is no excuse for the smith who works all day in atmosphere thick with soot, smoke and coal gas—any wonder he can't think clearly, do proper work, has ill health? A smith spends almost all his waking hours in his shop and should insist upon proper conditions.

A powerful searchlight was recently installed on the Lake of Geneva, Switzerland, at an altitude of 3,600 feet. The searchlight is handled with the greatest ease, sending its powerful rays a distance of over 7½ miles. Objects at 6½ miles can be distinctly seen. The machine providing the power, is of 24-horsepower and furnishes a 1,000,000 electric candlepower light. A 40-horsepower motor would give 12,000,000 electric candlepower. The great advantage of this searchlight is that it may be electrically handled in all directions by wire from a distance of 656 feet from the motor car, which transports it and sends it to the required spot. It thus enables the driver and observer to send the rays to any place they desire without being blinded.

### American Association of Blacksmiths and Horseshoers.

A recent letter from a progressive Kansas craftsman, tells of a typical case of price cutting in which the proper remedy, organization, was administered.

This brother says: "There was always cutting of prices between the smiths here and our adjoining town. But last year we joined together, agreed on prices, had a price list printed, tacked it up in our shops and have since been doing fine. Since, we found that some of our prices were far too low for the way material advanced. And then again some of our patrons go from one shop to another and say that so and so will do work for less. But now we just show them our prices, that is enough. If all smiths would do something in this line there would be less strife. Don't be afraid to go into your brothers smith's shop and talk with him. If he is a man he will appreciate it, if he is not, you don't want him."

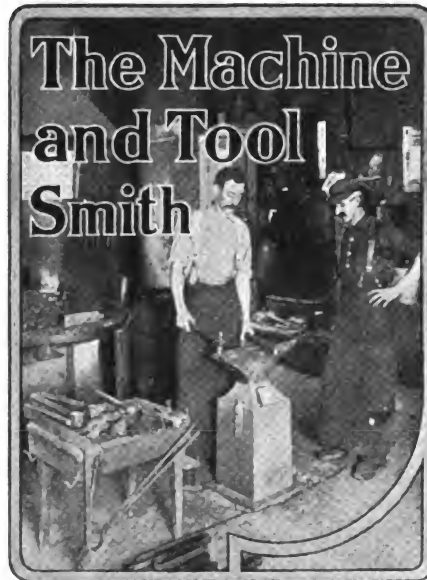
Does the same condition, cited in the first part of this letter, exist in your locality? Do you get proper pay for your work? Do you get your pay after earning it? Why not administer several large bottles of organization tonic now? Why allow your customers to live in luxury on money that rightfully belongs to you? This is exactly what they are doing when prices are such as to allow little or no profit, or when it is impossible for you to collect your accounts. Write today, now, for our plans forming branch associations. It will be the means of raising the standard of the craft in your locality. A penny postal will do. Just say, "Send plans for forming association." Sign your name and address, and write "American Association of Blacksmiths and Horseshoers, P. O. Box 974, Buffalo, N. Y." on the address side. By return mail, will come full plans and information. And with our co-operation, you can have a big, strong, healthy, organization in your county. Do it now.

### A Light Silver Plate for Iron or Brass.

E. C. JOHNSON.

The smith, when called upon to repair guns, revolvers or other plated goods, will sometimes bruise or knock off a spot of plate or may sometimes find it necessary to match a screwhead that is plated. Those of the readers will find the following very valuable: Polish the work very smooth and bright. Then take a lump of sulphate of copper, wet it with water and then rub it on the bright surface of the work. It will dry in a short time, leaving a thin coating of pure copper. After drying repeat the operation. Now dissolve some silver in nitric acid, assisting the dis-

solution with heat. Then precipitate the silver by placing several pieces of copper in the solution. Now mix about fifteen or twenty grains of the precipitate with one-half drachm of alum and two drachms each, of tartar and common salt. Pulverize well and mix thoroughly. Now rub the work well with this mixture, using a chamois skin and plenty of elbow grease. Rub the metal until white, then buff with soft leather. Inferior as this seems it will wear quite a long time.



### Hardening and Tempering Steel—7.

E. R. MARKHAM.  
Overheating Steel.

Too much emphasis can not be laid on the necessity of heating steel to the proper temperature. A tool that is heated properly for forging might be altogether too hot for hardening. Every degree of heat, above the refining heat "opens the grain" making it porous and weak. This is also true of the lower grades and for this reason, if low grade steel and iron are welded together, it will be found that the steel will break much easier than the iron when the area of the two are the same. However if we reheat the piece to a low red after welding and allow it to cool off slowly, the structure of the steel is changed, the grain is made close and the steel will be found stronger than the iron. For the successful forging of many articles made from low grade steel, it is absolutely necessary to heat to a temperature that renders the steel brittle and weak, but this may be easily overcome by allowing the pieces to cool, then reheating and annealing them as before described.

When forging gun, pistol frames and

similar pieces from mild steel, it would be impossible to force the stock into the dies unless high heats were used and as these render the frames so brittle as to break when machining or in use, after forging, the frames are carefully annealed to restore their former structure and strength.

When heating for annealing or hardening, the operator may become careless and overheat the steel but unless the steel has been actually burned, it may be restored by allowing it to cool then reheating to the proper temperature. Overheating steel should never be allowed as it strains the steel and in a measure renders it unfit for use. But, it is not necessarily fatal to the steel if proper measures are taken to restore it. Do not make the mistake of thinking that if a piece of steel is overheated when it is to be hardened that it may be in any degree remedied by allowing it to cool down to about the right heat and then dipping it in the bath. The effects of the high heat remain until the steel is reheated to the proper temperature and the steel in this way restored.

There are several causes that lead to overheating steel. The first cause is carelessness on the part of the operator. I don't know of any remedy for this, except to "fire" him and get a careful man. A second cause is strong light. This may shine either from a window or down the chimney and into the fire or into the operator's eyes in such a manner that he cannot see his heats. This trouble should be immediately remedied. The operator should be able at all times to determine exactly the heat of the piece of steel in the fire. For this reason a muffle furnace, or an open fire burning gas as fuel should be used. When burning coal it is necessary to bury the work in the burning fuel, and it must therefore be watched very closely to prevent the overheating of the light portions. The old saying that "a chain is no stronger than its weakest link" holds good when hardening tools. If the main part of a tool is in good condition and the projection, which must do a certain amount of work, is weak, the tool is no more effective than the weak projection.

In the jobbing shop where the smith has a fire of "sea coal" for general work, he must exercise extreme care if he attempts to heat light sections of tool steel as the intense heat resulting from such a fire is apt to overheat such sections very quickly. A mistake made by some smiths consists in hardening a tool directly after making a weld. The

smith's eyes after making a weld are in no condition to discern the proper hardening heat for a piece of steel.

At times a smith will attempt to heat a dozen or more pieces for hardening at once. This is all very well where the pieces are large, the fire well under control and especially when a muffle furnace is used and where the temperature is so regulated that the pieces cannot become overheated. But, if he is using the ordinary forge where almost any heat is liable to result he must use extreme care if he heats several pieces at a time. There are other causes for overheating, but I think they will suggest themselves and in any case they must be overcome if we would have success in heating steel.

There are on the market several compounds for restoring "Burnt" steel. I formerly called these "nostrums" and classed them all under a heading of "humbugs". But a number of years ago an old gentleman whom I knew well, and who knew my views on this

grinding the two tools, I tested them and found the one he had treated stood up as well as the one I had hardened so carefully, thus exploding my theory regarding the uselessness of all restoratives of burnt steel.

I do not mean however to be understood as advocating the use of any of the various compounds on the market. I wish it were possible for me to impress on the young hardener the necessity of keeping his heats down, of having them uniform and of so conducting his heating that it would not be necessary to observe any of the instructions regarding the restoring of overheated steel. And lastly if he does overheat it, to be sure and allow it to cool off and reheat properly and so restore it.

*(To be continued.)*

### A Nebraska Shop and a Home-Made Shoeing Rack.

FRED RICKERT.

The accompanying engraving shows the interior of my shop, and also a partial view of my shoeing rack, which I



A NEBRASKA SHOEING SHOP WITH A HOME-MADE HORSE RACK.

subject told me that he knew of a compound that would restore steel that had been actually burned. I had too much respect for my venerable friend to laugh at his statement, but I did tell him I thought he was badly mistaken. He actually seemed to pity me in my ignorance and said that if I would take two tools as nearly as possible in the same condition, harden one as nicely as I could and actually burn the other, he would restore the latter and I might test it in comparison with the one that was hardened properly. I did as he requested—hardened the first as nicely as I knew how and then overheated the other as much as I could and not actually melt it. He then took the tool that I had overheated and treated by bringing it to a good, nice, red heat and dipping it into a mixture that I shall describe in another article. After

myself built at a cost of \$25.00. I have already shod fourteen horses in it and have had no trouble with any of them. I have the only shoeing rack in this city, and we have about twenty shops. The rack is made to hold the horse by means of ropes.

As seen in the engraving, I run two fires and do a general smithing business. We have considerable shoeing to do.

### A General Talk on Brazing.

F. L. BROOKS.

Brazing, or soldering with brass, is a process which may be briefly explained as follows: The surfaces to be joined are first thoroughly cleaned every particle of dirt, grease or other foreign substance being removed. The pieces are then joined together in proper position by means of wire or clamps. The joint is now heated, a flux, usually borax, being used to prevent oxidation.

The spelter or brass filings are now sprinkled over the joint, and the heat is raised until the brass flows into the crevice, making a union of the pieces. Almost any metal that can stand the heat can be brazed. In brazing cast iron, extreme care must be exercised to insure scrupulously clean surfaces on the pieces coming in contact, and then properly protect them from the oxidizing influences of the air and fire, while being heated. Brass wire is particularly convenient for use in brazing, although brass filings and small strips of rolled brass may also be used in place of the spelter.

To illustrate a simple form of brazing, a collar or flange is to be brazed to the end of a pipe. It will be found unnecessary to use clamps or wire in this case, but the joint should be open sufficiently to allow the melted brass to flow freely between the two pieces. Both the end of the pipe and the inner edge of the collar, where it comes in contact with the pipe, should be filed bright and all rust and dirt removed. Now place the pieces together in proper position, bending a piece of brass wire around the pipe at the joint, and place in the fire. Fire for this work should be exceptionally clean and bright. Now sprinkle the joint with flux. A good mixture consists of about three parts borax to about one part salammoniac. The heat is now gradually raised until the brass melts and runs freely all around, and into the joint. The piece can now be taken from the fire.

Should spelter be used instead of the piece of brass wire, it should not be placed on the joint until the flux starts to melt. It is convenient to use a long handled spoon in this case.

When using borax as a flux, the melted scale should be scraped from the work while still hot, otherwise it will be found difficult to touch it with a file. The borax when cold, makes a very hard, glassy scale.

### Horseshoeing and Corns.

E. E. HURRELL.

I find that opinions differ so much on horseshoeing that it is almost impossible to carry any one idea into a general system. It has always been my ambition to make the structure and functions of the horse's foot easily understood and help to carry it to a science. It's too bad that we lost the name "Farrier" which originally meant, one who professes to cure disease of the horse's feet. But we have been so long making a profession of the trade that we have entirely lost its name. It is



well known that most all ailments subject to the horse's feet are under the supervision of the horseshoer. Therefore it is requisite that he should understand the anatomy and physical laws as well as mechanical rules of the foot before he can remedy its ailments.

Corns seem to be one of the most obstinate cases that come under his observation. Some authors define the term corn as a callous substance resembling the corn of the human foot. But they are confused by the cause and location being generally the same. This is quite true, but it is certainly a misapplied term when connected with the foot of the horse. The discoloration which appears between the bar and wall is a deposit of blood after a rupture of the blood vessels which form such a complex net work around the foot. This part of the foot has had to do more than its share of work. Corns are chiefly found on the inside of the foot because we are in the habit of fitting the shoes closer to the center of the frog than the outside, thus throwing the work on the inside heel.

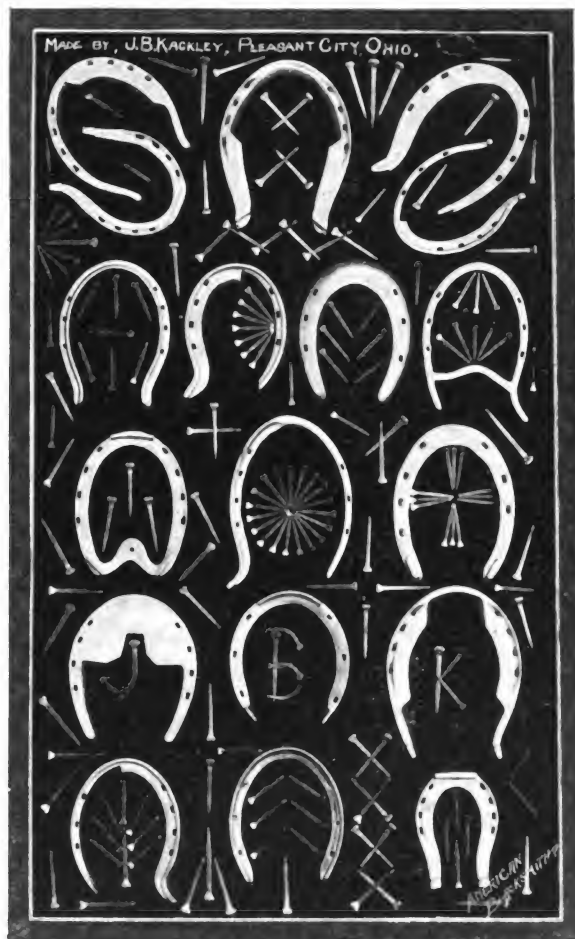
Another error is making shoes right and left. Why should this be done, there is no distinction in the anatomy? The foot has as many points of observation as a marine compass and each point must be rigidly observed if we wish to be successful in manipulating the ailments of the foot. The shoe must be of equal distance from the centre of the frog in order to balance the foot. If this cannot be done by nature, mechanical rules must be followed.

#### A Case of Special Shoes.

J. B. KACKLEY.

The case of shoes shown in the accompanying engraving was made by us at our shop. The various shoes are of course for different gaits and defects. To explain: The first shoe in the upper left hand corner is a front side-weight shoe, to make a horse toe in or out. If the horse toes in, place the wide web on the outside; if he toes out, place the wide web on the inside. Number two—is a common hind shoe for road horses. Number three—is a front shoe to shorten the stride and can be used to prevent forging. The shoe in the upper right hand corner, is a common hind side-weight. It can be used as a "striding" shoe but is used mostly to prevent ankle hitting. Number five—is for horses that wear heavily on one side of the foot. Number six—this shoe is to shorten the ground tread and to quicken the front foot action.

Number seven—is a front shoe for ankle and knee hitting. Number eight—a rolling motion shoe for various purposes. Number nine—a hind bar-shoe, very light for speed horses. Number ten—a front bar-shoe with toe and heel calks for fast-trotting horses; one of the best shoes in the case. Num-



A CASE OF SPECIAL SHOES.

ber twelve—this shoe is to be used on trotters for road use. Number thirteen—a toe-weight shoe; when made light will balance and square the action and gait. If inclined to pace or rack, make it very heavy at the toe and light at the heel and you can make a pacer trot. Number fourteen—a front shoe; the best shoe made for speed. Number fifteen—hind shoe for wheeled feet or it can be used to prevent forging. Number sixteen—hind shoe for ankle and knee hitting. Number seventeen—this is a great shoe for hard or slippery tracks and a good shoe for speed. Number eighteen—a mule shoe. One person said it was the nicest shoe in the case.

#### A Plain Talk—Oil Furnaces.

GEORGE JORDON.

I am convinced that oil furnaces must be built according to the class of

work for which they are to be used. We have ten oil furnaces running in our shop at Houston, Texas. We are only about 17 miles from the oil fields, and oil is very cheap while coal is expensive and we do all the blacksmithing possible in oil furnaces.

I believe the most important point in constructing an oil furnace is to have sufficient air or fan blast to cause proper combustion in the furnace. In order to do this, you must have not less than eight ounces of fan blast, or from sixty to seventy-five pounds of air pressure, to cut your oil or spray it properly into the furnace.

The construction of the burner also forms a very important item in the successful operation of an oil furnace. We have many kinds of burners in the different furnaces in our shops, such as steam, compressed air and fan blast burners. We use only air and fan blast in the blacksmith shop, as we believe them to be the best. I tried steam burners but they did not work well on account of the water connected with the steam, which prevents getting a good welding heat on iron. We have one large scrap or axle furnace in which we heat ten-inch driving

axles. It is operated with ten-ounce fan blast, three burners at one end, and stack at other end, and has two doors. The burners are made of 3-inch gas pipe with  $\frac{3}{4}$ -inch oil pipe in center. In constructing pipe burners, you should have the oil pipe back of blast pipe and 1½-in. from the end of same, and protected by about two inches of extra fire brick inside the furnace. Without this arrangement, you will experience great difficulty in keeping the oil pipe clear of the severe heat with which it comes in contact inside the furnace.

On every scrap furnace there should be a combustion chamber, or fire-box about three feet wide, with a bridge extending well over the burners, so that the oil will have no possible chance to come in contact with the piles of scrap or slabs in the furnace. If the oil does come in contact with the slabs, you

will have black seams or streaks in the forging and when it is planed or turned up, the forging will be condemned. This, of course, makes no difference in any but a welding furnace.

A bolt furnace should have a water front and a continuous stream of cold water running into the bottom of the water front, and the hot water running out through a waste pipe at the top. In this way the heat in front of the furnace will be diminished, which makes it much more comfortable to a man heating the iron. A bolt furnace should have two burners, one at each end, so that in case one burner gets out of working order, the other can be used. In all cases you must use blast in both burners and oil in only one; otherwise the burner which is not working will be damaged or ruined by the excessive heat. We use from 40 to 50 gallons of fuel oil in ten hours on one of these bolt-heating furnaces.

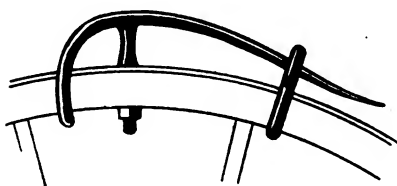
A spring furnace should have a combustion chamber, or firebox, and a stack to carry off the gases arising from the oil, so the spring maker can stand close to the door at all times with comparative comfort, in order to gauge the oil to keep the furnace at the same degree of heat and prevent overheating the steel. Our spring furnace has two burners at one end and stack at the other. It has fire-brick floor and is large enough to heat the longest spring leaves.

The construction of a flue furnace differs materially from any other, on account of the short heat taken in welding the scarf end on the flue. A flue furnace should have a combustion chamber, and from it should lead a narrow passageway (say about four inches square) to where the flame comes in contact with the flue. After it passes the flue there should be a stack to draw off the blaze and prevent its coming out at the opening where the flue is heated to be welded. If you have no stack on the flue furnace, you will get too long a heat on the flue, and it will be almost impossible for the flue welder to stand by his machine, on account of the intense heat and the gases arising from the oil. With the old coke furnace, 200 flues was a good day's work, while with one of these oil furnaces 400 flues can be welded in 10 hours with ease.

In regard to the kind of furnace best adapted for a bulldozer for heating arch bars, and all other work that needs forming or bending, I would suggest that it be wide enough to accommodate the longest piece of iron to be bent. Also, that it have one door opposite the one

out of which you are working, so when you have a piece of iron of extraordinary length you can put it through the opposite door. It should have two burners at one end and a stack at the other, to draw off the surplus heat and gases, so that you can put your machine close to the furnace door and save the unnecessary expense of handling the material at a distance. No combustion chamber or firebox is necessary with this furnace as no welding is done with it, and the burners can be run right into the furnace.

Another kind of furnace is that used in straightening steel-underframing for freight cars. When cars are wrecked, it does everything to them except tie them in a knot. In some cases they are about forty feet long and twenty inches



ANOTHER PRACTICAL DEVICE FOR HOLDING TIRE BOLTS.

wide, so I built a special furnace for them. This furnace is nine feet long, 30 inches wide and has two air burners on one side and two doors, one at each end, so that we can run the sheets clear through and heat them at any place where they are bent. This is a very good furnace for this class of work, as you can erect them at any place needed, and with very little expense can run air into it, and set out a car of oil next to it. The oil cars are of sufficient height to run the oil into the burners by gravity. By this process you can take an eight foot heat on a sheet  $\frac{1}{2}$ -inch thick in about five minutes.

#### Another Device for Holding Tire Bolts.

W. R. GARMAN.

Take a piece of flat spring steel, about 20 inches long,  $\frac{3}{4}$  or an inch wide, by  $\frac{1}{4}$  or  $\frac{3}{8}$  of an inch thick. Draw one end out and bend it forward so as to make a hook big enough to go over the rim as seen in the engraving. Then weld a short piece of steel to the center of the spring on the inside, and draw this short piece to a chisel point. Then draw the back or long piece to about  $\frac{1}{4}$  of an inch thick, decreasing in size from center to opposite end from the hook. Now make a ring of  $\frac{1}{4}$ -inch iron rod with a hook on one end. Now press the spring towards the rim and slip the rim over end of the spring. It will hold the bolt securely.

An advantage in many cases and an impossibility with many other bolt-holders.

#### A Peculiar Case of Interfering Hind.

E. W. PERRIN.

The engraving shown herewith, Fig. 1, shows the hind legs of a bus horse belonging to a local transfer company. This is a stoutly built horse, a fine worker, but in the summer of 94 he was regarded as a chronic interferer. He used to hit his ankles so hard and constantly that the fetlock joint was considerably enlarged. You will observe some little enlargement yet remains although he quit interfering two years ago. On close observation you will notice the two perpendicular lines dropped through the points of both hocks, shows that both cannon bones are twisted from the hocks and that both feet toe outward. Not only this but you will also observe that the left ankle—fetlock—is somewhat outside of the center line, yet the hoof is low on the outside and high on the inside, while the right foot is high on the outside. This is the natural position of these feet, as is amply proven by the fact that so long as this position is maintained the horse goes clear.

This is another typical case wherein the left foot is high on the inside, while the right foot is high on the outside. If you place a "hoof leveller" under the left foot of this animal, the indicator would show this foot to be about three fourths of an inch low on the outside, yet every attempt to raise the outside of the hoof to the level of the inside causes a recurrence of the interfering. About a year ago this horse came to my shop in my absence with both hind shoes gone, the men knew that this horse was shod with odd shoes, but did not remember which foot was high on the outside, and in mistake put the calks on the wrong shoes, (see the shoes with which this horse is shod Fig. 2 & 3) with the result that he began to interfere the very next day. It may be urged that the left fetlock is bent outside. To be sure it is, but it has occupied this position since colthood. This defect in conformation may have resulted from lack of care of the hoofs during colthood, or the animal may have been foaled with this defect. But what ever [the cause, it is evident that the animal grew to maturity with his fetlock in the position shown in the picture, and since this position is perfectly natural to this particular animal, the main problem in the treatment of

this case was to discover the relative natural position which the feet bear to the limbs above them.

### Anatomy for the Horse-Shoer.

T. J. KEAN, M. D., V. M. D.

Unless the average horseshoer is encouraged in his efforts to acquire knowledge and the way pointed out for him, he is not very apt to master the finer details of his art, but is in danger of dropping into a routine that never leads to good results. The one branch of knowledge most conducive to good results is anatomy. It is an undeniable fact, that the horseshoer, who is to successfully solve the problems of his business, must have knowledge of anatomy. Of course, in a study as vast as the one under consideration, there must



FIG. 1—BOTH CANNON BONES ARE TWISTED FROM THE HOCKS.

be parts not necessary for the horseshoer to study. On the other hand, the idea seems to exist that if the horseshoer understands the hoof and its contents, with the bones, ligaments and tendons below the knee and hock, he will have about as much anatomy as he can well handle. In this we err I think more seriously than do the men who insist on the greater course. Certainly, if the student intends to work among slow moving horses only, possibly the shorter, simpler course may serve the purpose. But for the man who hopes to advance himself and to

take his place in the front rank of his profession, anatomy from the knee and hock down is not enough. The shoeing of track, road and the better classes of coach horses, present problems that tax the wisest. Here is where a full knowledge of the organs of locomotion, at least, comes into play. Horses vary greatly in their relative conformation, and unless one is able to accurately diagnose each case, one is very likely to drop into practices that produce any thing but good results.

Anatomy of the horse, for the horseshoer, is simply knowledge of the different parts of the horse, but not necessarily of the finer details of the nervous organs and vessels that the veterinarian is compelled to know so accurately. Our studies should lead rather to a knowledge of the organs of locomotion. These would include the bones, joints, ligaments, tendons and muscles. Anatomy for the horseshoer also includes physiology of movement and outside the knowledge of the hoof, which all should learn perfectly, it is this we need most and what we should strive for in our studies. To know how to change the motion of a foot and leg; to prevent interfering, for instance, and to make such changes positively, and without experimenting, we must know enough about the motion of the leg so as to know why the horse strikes and just what to do to swing the foot clear. To the man whose hands have been educated and whose eyes have been trained, the knowledge of anatomy is of the greatest assistance. It enables him to see what would otherwise be obscure, and assists him in reasoning on what he does see. It makes him observing. You will find that every successful horseshoer (I don't mean successful from the point of view of dollars and cents) has learned to interpret the movements he sees the horse make. He may not be able to put what he sees into words, or to explain what he sees to any one else but is perfectly clear to himself. In many books you will find pictured and described shoe after shoe for the cure of every trouble we meet with, but nothing of value about the cause of these troubles. Apparently the men making the shoes are unable to explain causes. They have attacked the problem at the wrong end, the curative shoes they advise coming after a series of experiments conducted more or less in the dark. I have no doubt that every shoe as described and advocated, served the purpose for which it was created. But I am unwilling to admit that success

was due to any property inherent in the shoe themselves, because they vary and differ so radically in shape, weight width of web and in the position, shape,



FIG. 2—LEFT HIND SHOE FOR CASE OF INTERFERING HIND.

and size of calks. Some are the direct opposite of others made for the same purpose and anyone apparently serves the purpose for which it was designed as fully and completely as any other. Success cannot, therefore, be due to these peculiarities of shape, weight,



FIG. 3—RIGHT HIND SHOE FOR CASE OF INTERFERING HIND.

calks, etc., Successful results with these shoes come, not because of them, but in spite of them, and is due to the other parts of the work. It is my belief that if the makers of these different shoes got together and demonstrated their work on the living foot, they would agree in every essential part of the work, no matter how radically they might differ about the shoe itself. This must be the case, if each meets with success. Anatomy and physio-

logy of motion, teach us of what these essentials consist. It would also put them in a position to teach others. We will find some bright day that horse-shoeing is a science, because the observed phenomena are known to rest on well defined laws or principles that must and do really exist.

### Painting and Finishing Old Buggy Bodies.

M. C. HILLICK.

A subscriber desires information on "how to paint old buggy bodies so as to obtain a smooth, brilliant appearance." He fails to mention the matter of price in connection with this work, but we infer that a comparatively cheap job is intended. In country districts, the majority of vehicle owners do not want to pay more than from \$4 to \$8 to have the buggy painted. The \$4.00 job belongs in the class of "touch up and varnish" work, but in the country it can usually be colored all over and varnished for that price.

In this article we have only to do with the body, and for the \$4.00 job we take the body and look it over carefully. If checks and cracks in the varnish are visible, do not apply water to the surface. Instead, take number 1 sand-paper and smooth the surface down fine, clean and uniformly. Water, and rubbing with felt, serve to increase the size of the checks. If the varnish is free from fissures take a piece of rubbing felt, moisten it in water, then dip it in number 00 pulverized pumice stone, and rub the varnish, thus taking away the gloss and reducing any dirt accumulations present on the surface. Apply one coat of color and then one coat of finishing varnish.

For an additional dollar, apply a coat of color varnish over the coat of flat color, rub with the pulverized pumice stone, as above advised, and finish. This gives a finish of deeper lustre. For a richer finish, after rubbing the color-varnish coat, apply a flowed on coat of clear rubbing varnish. This will stand a hard, firm rubbing with the water and pumice stone. Then wash up clean, and finish. This process gives a finish of still deeper brilliancy.

For the body badly cracked and checked, as many bodies are, sand paper with number 2 paper to tear up the surface as much as possible for a foothold for the coats to follow. Dust off and apply a coat of lead, shaded with lamp-black to a slate color, the proportion of oil being  $\frac{1}{2}$  oil to  $\frac{3}{4}$  turpentine, the pigment thinned to a consistency to permit application with a  $2\frac{1}{2}$ -inch camel's

hair brush. Permit this coat to dry 48 hours. Then smoothly putty deep cavities, if any, after which "face up" the cracked surface with a putty consisting of  $\frac{1}{4}$  roughstuff filler,  $\frac{1}{4}$  gilders whiting and  $\frac{1}{2}$  dry white lead, these pigments being mixed to the proper consistency with equal parts of rubbing varnish and coach japan. Do not mix quite as stiff as for putty. Then with a  $2\frac{1}{2}$ -inch half elastic French scraping knife, proceed to glaze or "face up" the entire surface, making as far as possible, a smooth, uniform coating of material. Give this 36 hours to dry. Then apply a single coat of dark roughstuff to serve as a guide coat in rubbing out.

The day following, proceed to rub the surface down with artificial rubbing stone and water. Then apply one coat of flat color, then a coat of color varnish, after which, in due time, rub the surface lightly with water and pulverized pumice stone, touch up with color, if necessary, and finish. If the customer is willing to defray another dollar of expense, apply a coat of clear rubbing, over the color-varnish, then rub hard and close and finish. The coat of roughstuff may, if desired, be omitted, in which case, with the rubbing stone dipped in raw linseed oil, and number 00 pulverized pumice stone, the surface can be rubbed to a smooth solid condition upon which, with processes outlined above, the finish may be reached very cheaply.

To eliminate the checks altogether, if the customer can be induced to stand the expense, burn the paint from the body with a gasoline burner as described in an earlier issue of this paper. Avoid charring the wood. Coat with the lead paint advised above. Then when this coat is dry, putty with a regulation hard drying carriage putty, after which in regular order, apply 4 coats of roughstuff, laying off the first coat with vertical strokes of the brush, and the second coat with horizontal, following the practice with the two remaining coats. Rub out with water and composition rubbing brick, taking much care to rub to a fine, uniform quality. Then when the moisture has dried out, sand lightly and apply 1 coat of color, 1 coat color-varnish, 1 coat of clear rubbing varnish and finish. Rub on both coats of rubbing varnish, (the color varnish being termed a rubbing coat) and work the surface as clean and smooth, as possible.

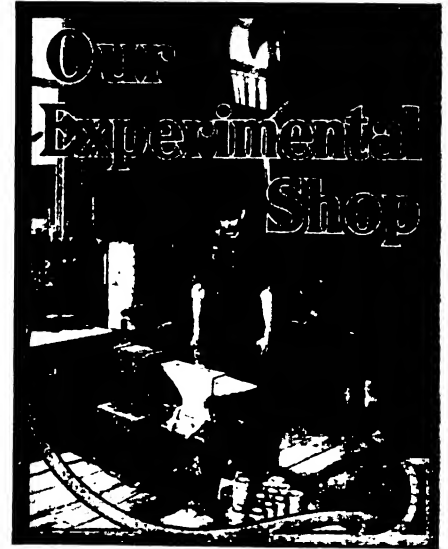
In all carriage body work, hold fast to the following rules:—

1st—Use good tools—always.

2d—Use only first-class paints and varnishes.

3d—Be diligent in taking pains with your work.

4th—In rubbing roughstuff or varnish be thorough—a good finish depends in a large part upon the rubbing of the surface to be finished.



Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

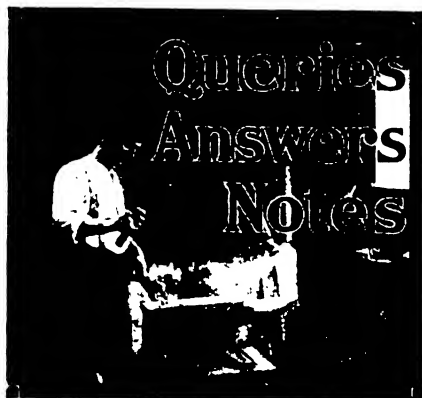
A Western smith who accidentally forgot to drain the cylinder jacket of his gas engine one extremely cold night, experienced the usual result—a cracked water jacket. In repairing it he used a cement made as follows: To sixteen ounces of cast-iron filings or borings, add two ounces of ammonium chloride and one ounce of sulphur. Mix them thoroughly. Now, mix to each part of this powder, 20 parts of filings or borings, adding water and thoroughly mixing to a stiff paste.

A practical New England smith writes as follows: "No doubt, many of your readers have discarded grind stones on account of a piece being broken out of the grinding surface. I had an accident of this character but determined to mend the stone, if possible. After discarding several cements as impractical, I finally mended the stone with a strong solution of good Portland cement, allowing the stone plenty of time to dry. The cement consisted of pure Portland cement and water only.

A formula for removing old paint is given as follows, by a practical vehicle painter: Into one gallon of hot water, place  $\frac{1}{2}$  pound each of china clay and starch, stirring the mixtures well and thoroughly to prevent lumping. Now, dissolve four pounds of concentrated lye or potash in one gallon of boiling water, and, after allowing to cool, mix the latter solution with the clay and starch solution. Stir thoroughly while mixing until it forms a smooth, thick paste. Apply the mixture with a fibre brush and after raising the paint, wash the surface with warm water. After a thorough washing, apply a coat of vinegar and allow to dry. This method, while tending to slightly raise the grain is not objectionable, if the surface is to be repainted.



Another new tempering compound has been in use at the shop for some little time and has been found especially fine for tools regular in form and having no thin cutting edges:—punches, cold chisels, flat drills, etc. Thoroughly dissolve one ounce of bi-chloride of mercury and two pints of common salt in 1½ gallons of clean rain water. Stir the mixture well until dissolved. It is then used in the usual manner, the tools being dipped and drawn.



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**What Cold Tire Setter.**—Can any one tell me which kind of cold tire setter is the best and does the iron get brittle by upsetting it cold?  
A. H. BLUM.

**Welding six-inch Tires.**—Would some of our American smiths give us a few hints on welding 6-inch tires as they are greatly in use in this country?  
NEW ZEALAND.

**On Brazing Iron.**—Will some brother smith please write an article on brazing? I mean uniting broken pieces of iron when they cannot be welded.  
WM. J. RUST.

**A Horse With Weak Quarters.**—Would like some brother smith to tell me how to shoe a horse with weak quarters and heavy front, but not contracted heels. Can some brother tell me?  
GEO. BORING

**Wants a Good Engine.**—I expect to install a gasoline engine in the near future and think the Weber will be my choice. Those of the readers who have tried the Weber will do me a favor by letting me hear from them.  
W. S. SMITH.

**Instructions on Brazing.**—Would some of the brother craftsmen who have had experience in brazing metal, and been successful, please for the benefit of beginners, give some instructions on that particular branch, and oblige.  
J. J.

**Hub and Hollow Augers.**—I would like to ask some of the readers, what is the best or most up-to-date hub auger to bore hubs from buggy sizes up to 2½-inch, or would it be better to have two sizes? Also would like to inquire about the best adjustable hollow auger.  
W. H. TIPPIN.

**A question from England.**—I should feel obliged if some brother smith could tell me which is the best shoeing machine (for heavy horses) you have in your country, and the cost. I think they are far beyond anything similar I have ever seen in my own country.  
HENRY CULLEY.

**A Question on Welding.**—I have a good deal of 1½-inch cast steel to weld, I upset and split one piece, scarf the other piece, fasten it in the split piece and weld with borax and sand. Sometimes have a good bit of bother getting it welded. If any brother smith has a better way, or a better composition, would like very much to hear from him.  
WILLIAM GINTER.

**In looking over The American Blacksmith.**—I noticed that some brother smith is having trouble with a toe-wide interfering horse. I had some experience with the same kind, but have good success by covering the first nail hole on the inside with end of toe. Raise the inside heel about ¼-inch higher than the outside. This will fix the animal all right.  
J. L. MUNSON.

**To Stop Forging or Clicking.**—Can some brother smith tell me how to stop forging. I have a driving mare to shoe that is a terrible forger and she hits her front foot in breaking over, striking right in the center. I have tried every way that is possible within my knowledge. Kindly show cut and give weight of shoes for both the front and hind feet.  
WILLIAM WALSH.

**How to Dress Screw-plate Dies.**—To dress Green River Screw-plate dies, draw the temper, plug the two spaces with iron and dress the plugs until the whole forms a circle. Now put the dies back into the stock and run the top through them. Now, drive out the plugs. Then with a round file dress out the space, retemper, and you have sharp dies.  
J. T. PHILLIPS.

**A Shoeing question.**—Will some brother please tell me the best way to shoe this horse. I find trouble in making a shoe stay on his right hind foot. His foot or ankle has been twisted backward and he stands on the front of his hoof. In traveling he strikes the toe against the ground, but he straightens his foot when he puts his weight on it. It also grows very fast, is very soft and is inclined to cup up in front.  
R. R. H.

**A Blacksmith and Postmaster.**—I am a young reader of your valuable paper, which I appreciate very much, and love to read the statements that the brothers of the craft give. I have a side line which may seem peculiar to some. I am a Postmaster. I have been a blacksmith twelve years and love the work. I do all kinds, blacksmithing, horseshoeing and wood work. I wish to ask the brothers of the craft to give their experiences with cold tire setting machines. Kindly give name of machine with your experience.  
A. A. KAMP.

**To Cure Interfering Front.**—For the benefit of Garnet E. Rowe. For your horse that hits in front when walking, take what you would call a light shoe for size and weight of horse. Pare foot as short as possible and get horse to stand square and level. Now, fit the shoe close all the way around, leaving the heels as long as horse will carry without pulling them. Fit the toe of the shoe flush with the toe of the foot, round the inside toe of the shoe and slightly raise the outside toe. One point to be remembered particularly, is not to stub off your horse's toe.  
H. O. EGGLESTON

**Tempering Granite Chisels.**—I would like a recipe for tempering chisels for cutting granite. I can temper chisels and drills for rock but not for granite. If some brother smith will kindly give me some advice, it will be appreciated.

Some brother asked in the paper, for a recipe for tempering springs. Make your springs red hot and dip in warm water. Now, fill a ladle with lead, heat until blue cast comes on, and take off the fire. Put in your springs, hold under for a few seconds. After a few trials, you will not miss one in twelve.  
F. M. ANDYKE.

**From a Young Ohio Smith.**—As I am paying my subscription I will give some prices.  
4 new shoes toed..... 1.20  
Setting wagon tires, each..... .50  
Setting buggy tires, each..... .50  
New wagon tongue..... 2.50  
New wagon axle..... 3.00  
Filling wagon wheels, each..... 4.00

Other work is in proportion. I am a young smith and have only been in business for myself about ten months but I could not do without THE AMERICAN BLACKSMITH. It is a great help to me.  
R. E. PRYOR.

**Shoeing for Interfering.**—As this is my first attempt to write to THE AMERICAN BLACKSMITH, I will give you my experience of shoeing a horse that interferes. First pare the foot, leaving the inside ¼ to ½ of an inch higher at the heel gradually tapering to center of toe. Next fit the shoe to the foot and do not leave the inside of the shoe straight but rasp the wall of the foot to the shoe. Cutting the wall of the foot injures it, to which I think all brother smiths will agree. I am 32 years old and have shod horses for 15 years in the states of Kansas, Nebraska, Colorado, Iowa, Missouri and Dakota.  
C. W. GARLAND.

**Regarding Shoeing Stocks.**—In regard to shoeing stocks and which would be the best, would say that I have seen some of them work and have observed pictures of others. Some will fall to pieces and nearly kill both the horse and blacksmith, while others will work all right, providing there is plenty of good help and nothing gives out. Some smiths say that they can shoe any horse that ever walked by simply putting their strength against a bad horse, but that sounds foolish. I have a little trick with a ½-inch rope that will conquer any kicking horse in two minutes without throwing the horse or injuring the horse or man and your horse is broken for shoeing forever. All the help you need is some one to hold the rope and it's put on in a second.  
H. STADE.

**The Refining Heat of Steel.**—I visited a shop the latter part of October and saw a copy of your paper. I looked through it and gave the proprietor a dollar for one year's subscription. I had been looking for just such a paper for 2 years. I think it is a grand paper. I have only worked two years and that by myself. I cut down buggies and wagons, make buggy backs and repair them, shoe horses and repair all kinds of farm tools. Never yet had a job I could not do, but I have had to do some mighty hard thinking. I have a teacher now—THE AMERICAN BLACKSMITH. I never get tired reading it. Would some brother smith tell me what is the refining heat of steel? I use powdered borax alone for welding steel and find it O. K.  
MASION HUFF.

**Can You Beat This?**—In every issue of the AMERICAN BLACKSMITH I see some brother Smith contributing to the columns of your paper. I have a little that I thought might be of some interest to the trade. From December 4, 1905 to December 9 1905, inclusive of both,

days, I fitted up, drove and finished 513 shoes. All the help I had was my father who heated the shoes and knocked out the old nails. I did this in 61 hours. They timed me on one horse and driving, clinching and finishing four shoes I did in 6½ minutes. At another time I fitted up shoes and dressed the feet of 6 horses in 40 minutes. We get 15 cents a shoe for setting; 35 cents for new shoes; for Neverslips, \$1.25 a pair; buggy-tire setting \$1.50 and wagon tires 3-inch, \$2.00.

CLINTON STONER.

**A Question of Axle Gauges.**—Please state which is the best axle gauge made. All manufacturers claim to have the best, but as I want something good, something I can rely on, I would like some brother to tell me his experience. D. D. ELLIOTT.

**How to Measure Stock Forgings.**—In answer to G. W. Mallette's question about how to measure stock forgings, would say that three times the diameter and three times the thickness of the stock and allowing for the weld will make a ring the required size. Solution for a 4-inch ring from ¾-inch rod.

$$3 \times 4 \text{ inches} = 12 \text{ inches}$$

$$3 \times \frac{3}{4} \text{ inch} = 2\frac{1}{4} \text{ inches}$$

$$\text{For the weld } \frac{3}{4} \text{ inch} = \frac{3}{4} \text{ inch.}$$

$$15 \text{ inches answer.}$$

H. H. SMITH.

**For an Interfering Horse.**—In reference to the inquiry of our brother smith, Bethuel H. Jones, whose horse knocks with the heel of the hind foot. Pare the foot level, that is, so the horse appears to stand level and square on his foot. Then take a medium side-weight shoe (weight on inside) raise the inside heel of the shoe not to exceed ¼ of an inch higher than the rest of the shoe. Fit close to the heel clear around to center of toe, inside toe rounded off and outside toe square and full and slightly projecting outside of the hoof. This is so the horse in stepping will break to the inside of shoe. Close and turn outside heel and using your own judgment as to how much. This heel turned out is to offset the tendency of the foot to tip over by the slight raise of the inside heel. For your horses that go through their shoes so fast, weld on cast iron where the greatest wear comes and harden at a welding heat.

H. O. EGGLESTON

**One of the New Members.**—My first copy of THE AMERICAN BLACKSMITH was the February number, and I like it fine. It is a paper that every blacksmith ought to take and I find points in this number, that are worth the subscription for a year. I notice the advertisements of up-to-date tools. These are what a smith ought to have, first-class, up-to-date tools, if he wishes to do good work. It don't pay to buy poor tools. A good smith can do more work and better work, in the same length of time, if he has good tools. I notice some brother smiths writing in regard to shoeing. I agree with Brother A. N. Wells in regard to shoeing a horse that forges, as I think his theory is right. I find it that way in shoeing a horse that forges. J. C. PARKER.

**Several Questions on Founding.**—I wish to know what kind of fixture is used for melting a pint to a gallon of cast iron. It takes too much heat and too much time to melt it in crucibles. How are the moulds made, and what kind of sand is used? Is there anything else besides sand moulds used? Is there any difference on brass moulds? If there is, kindly tell me how to

make them. I am melting brass in crucibles. I suppose that is the proper way to melt brass, but I have been making the moulds of iron. This I find is too much work.

GILBERT STYNE.

**Another on the Circumference of Rings.**—I notice Comrade Philip's rule for finding the circumference of a circle in the December number, also Mr. J. H. Dube's rule in the February number. Mr. Dube has the idea, but there are lots of smiths in this country who would not understand what the .1416 part of his figures mean. Decimals are the thing when understood.

I think I have an easier way and accurate enough for general work. I add once the thickness of the iron to be used, to the diameter of the circle, then multiply that product by 22 and then divide by 7. Taking Mr. Dube's band, by his permission, an eight-inch band of one-inch stock. Eight inches plus one inch equals nine inches. Nine times 22 equals 198, and this divided by 7 equals 28 ⅓, or about 28½ inches of one-inch stock.

Another very good way is to multiply the diameter by 3 and add one inch for every twenty. If you want a 30-inch band; 3 x 30 = 90, and 20 goes into ninety 4½ times. Therefore, we take 94½ inches and ½ the thickness for welding. G. G. KEPLINGER.

**Handling Mean Horses without Stocks.**—In answer to Brother Marks in regard to horse stocks would say, I would not advise a smith to invest in any stocks unless he has more money and shop space than he knows what to do with. I will give you my method of shoeing mean horses, and we shoe everything that comes along without much trouble or danger of getting hurt. Take a rope 19 or 20 feet long and ¾ inch thick. Now take a leather strap about 12 inches long with a large ring riveted in each end. This strap is to go around the fetlock. Now tie a knot in one end of the rope and tie the rope around the animal's neck so that it won't choke him. Slip the other end through the two rings and bring it back again and through at the neck. Now pull the leg up tight and tie with a bow knot, so that one can jerk the end of the rope in case the horse throws himself. Now, make the horse go around the shop on three legs until he will stand to be shod, which will only take a short time. Hold up one front foot while you put the rope around his legs. I use this on both the hind and the front feet. CHAS. PAUSTIAN.

**The Painting and some Other Questions.**—As Brother Chunn, in the February number, probably refers to my article in which I said, the paint shop does not pay as well as repair work, I will answer his question.

I have always used the Schriber method of painting until last season. Then I tried some of Mr. Hillick's methods. My prices range from \$5.50 to \$15.00, for ordinary buggies. For instance, I charge \$7.75 for a phaeton. For that price, I burn the paint from the body and stripe body and gears. In all, priming, rough stuff and color, I give the body 7 coats, and 2 or 3 coats of varnish. If Brother Chunn would be kind enough to show me how I can do better, I would be very thankful for the information. I keep a strict account of all departments of my business and know at all times what is paying best.

I would like to hear from some member of the craft, who has taken up brazing of

cast iron. Would like to know with what success, what he uses, and how he does it.

Would also like to know how to fit steel wagon skeins to axles cut for cast skeins. also how to fit a steel skein on a new axle.

I am pleased to see THE AMERICAN BLACKSMITH get more interesting as it grows older. CARL G. WEICHMAN.

**Several Pointers on Babbitting.**—In answer to Brother Jacob Verrip's query, in the February number of THE AMERICAN BLACKSMITH, will state that I followed all kinds of engine repair work, and the best way I have found to babbitt all large and difficult boxes, is to first thoroughly clean the shaft or journal, then smoke them good and even all around. Put the boxes in the fire, if possible, or burn out by placing fire on them. This also helps to keep the metal from stalling, for a warm box will help the metal to flow a greater distance before cooling. Now adjust the box to the shaft, take pieces of cardboard cut in suitable widths and lengths to cover the difficult joints or apertures. Now cut some good bar soap into fine shavings and work up in hand, adjust cardboard to place and thoroughly seal with the soap, so as to exclude all air and hold the cardboard in place. Now bank heavy with good stiff clay or damp earth, leaving as large a vent at the top as possible, in order that the air may have room to escape while the metal is being poured into the box. Now heat the metal hot enough to fire a dry pine shaving. Then skim and pour oil over the surface. Now run it into the box while the oil is ablaze, and you will surely have a good box. Never undertake to run a box with metal too cool to blaze oil on immediate contact. Also avoid a cool box, if possible. H. C. ELLIOTT.

**A Letter and some Prices from Indiana.**—Our shop is 50 by 24 feet, and one story high. We have two forges, a No. 400 blower, a Western Chief Drill, a press tire shrinker, a rubber tire machine and other tools too numerous to mention. We also have a set of Barcus shoeing stocks which we praise very highly. Now, in regard to Brother J. F. Buyce about stocks, we will say we don't know how any smith can get along without them. We would like to tell him all about them, but it will take up too much space. Now, we will say something to Brother McCoy about plow work. In the February number we see that he is very swift. Now, Brother McCoy, please state to us what kind of plow share you put on plows in 30 minutes. We have put shares on in less than that, but they were cast shares and may be your shares are the same. We have been in the plow business about twenty-six years and we thought we were up-to-date, but by what Brother McCoy says, we are behind the times. We would like to hear from some other brothers about plow work. We give you some of our prices:

Shoeing, from.....	\$1.00 to \$1.30
Resetting 4 shoes.....	.60
Setting tires, buggy.....	2.00
Setting tires, wagon, from...	1.50 to 2.50
Wagon tongues.....	1.50
Wagon axles from.....	2.00 to 2.50
Wagon bolster.....	1.50
Shafts, buggy.....	2.50
Other work accordingly.	BENFER & BROOKS.

**An Interesting Item from California.**—I have no particular question to give answer

to, but simply to say that I am interested in the art of horseshoeing in the "Land of Sunshine and Flowers." I have worked at the business for over 20 years and sometimes find that I have a great deal to learn, for I have not found any set rules that I can work by. I simply have to be guided by cause and effect. I find that some things that were of value to me in the East are a detriment if practiced here in this hot climate.

However, I have been troubled a great deal with weak quarters and heels. I cannot agree with my brother, who says to raise the animal up on the heels. But I do most emphatically agree with the brother in the November number who produces frog pressure by means of a round or bar shoe, and I sometimes use the pad with success. In a great many cases I have overcome not only lameness, but also stumbling and knee-spring trouble. Of course, we all know perfectly that if a horse is not comfortable on his feet, he will get into a habit of trying to save them if he can, consequently comes the springing of the knees or stumbling and sometimes interfering. I find a horse will get into these habits when he is not actually sure, so that you can detect any lameness. And right here is where a man has to understand his profession and along these lines I heartily endorse the idea of a man passing an examination before being allowed to shoe horses. Let us also be better organized for the protection of our business. M. H. MAYBERRY

**Shoes and Shoeing.**—In the January issue Mr. Geo. F. Wherry, makes mention of my fin shoe which was published in the October issue. He says that the idea is old to him, but that it is new to many of the younger members of our craft. He says, that if the feet were properly cared for they would not need such a shoe. Now, I think just as he does: If horses feet were properly cared for he would not have to spread them by driving his nails at the inside of the holes. As for young members of our craft; I am practically a young member, but think that any man who follows the craft; no matter how long, never gets so old but that some young man may teach him something. I think by what he said about my shoe, he wanted to condemn it, but with as much tact as possible. I also think that the brother refers to the convexing of a shoe as being old to him. I have used convex shoes with good success, but the fin shoe is 90 per cent. better. My shoe was not designed for contraction alone, but to use also as a bar shoe, and it is far better in most of cases where a bar shoe is needed. For instance; where a foot has light walls and heavy braces and a low frog, make the fins level and to cover the braces. I do not condemn a bar shoe altogether, but I do not recommend them when a job can be done without them. The brother says that the frog should touch the ground, also that most shoers pare down the heels too much, and he gives no exceptions in either case. What do you imagine would become of the frog of a foot after the horse had traveled a couple of hundred miles on our gravel roads with a plain shoe and the frog touching the ground? With a deep or high frog and a thin sole having the heels high, how can you expect to have the frog touch the ground?

For the benefit of the younger members of our craft we should be very careful what

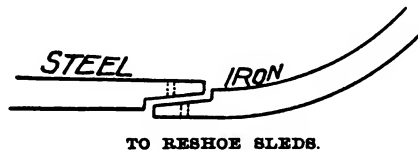
we say and to say it right, as it may lead to some great injury to them or to their customers. Also when we criticise a brother craftsman, we should be careful what point we discuss. FREMONT KELLY.

**Prices in the Lone Star State.**—I have seen prices on smithing from several states, but none from this state, so I will give some of my prices. I have worked at the trade for the past 13 years and haven't yet concluded that I cannot learn something.

Wagon tongues .....	\$2.50
Axles .....	3.50
Bolsters .....	1.50
Hounds, long .....	2.00
Circle, hounds .....	3.25
Coupling pole .....	.50 to \$1.00
Spokes, each .....	.20
Setting 4 wagon tires .....	2.00
Setting 4 buggy tires .....	3.00
Buggy spokes, each .....	.20
Rims per wheel .....	1.25
Setting axles each .....	1.00
Buggy pole and circle .....	3.00
New shoes, plain .....	1.00
With toe calks .....	1.50
Resetting old shoes per pair .....	.35
10 inch plow point sharpened .....	.10
12 inch plow point sharpened .....	.15
14 inch plow point sharpened .....	.20
Lister share sharpened .....	.25
New shares .....	3.00
New Plow shares .....	1.50 to 3.00

This is all at present. Some brother speaks about a clean shop, I tell you brother, that is half the battle. J. F. LONG.

**On Reshoeing Sleds.**—I noted Mr. Geo. Nablo's method of reshoeing sleds in the February number of THE AMERICAN BLACKSMITH. Up here in New Brunswick we have a different way, in place of hammering out steel we use iron on the turn of the sled and hard steel for the run. I don't see why he uses square headed bolts, as nothing but round headed bolts are used here and they are entirely satisfactory. The accompany-



ing diagram will convey some idea of our method. We use  $\frac{3}{4}$ -inch steel here for heavy sleds.

If Sawyer will put one thickness of sole leather under the bearing part of the shoe with a plate shoe, I think that he will have better satisfaction. JOHN D. GUNTER.

**A Letter from a Young Smith.**—THE AMERICAN BLACKSMITH has become indispensable to me since I began taking it. I take several papers but this is the most looked for and the most welcome when received. I am a young man 24 years of age. I commenced working in my uncle's shop when a small boy, doing small jobs such as painting plow-stocks and screwing taps on and off and afterwards I worked under my father until I became of age. I do all kinds of work that comes to a country shop. I make a speciality of horseshoeing and have built up a good trade in that line for a country shop. I use only the best of shoes and nails. I fit my shoes to the foot, not the foot to the shoe as is commonly done by some smiths. The first

thing I do is to pare and rasp until perfectly level, then I level the shoe and fit it cold. I never burn the sole of the foot as burning draws the substance from the hoof, and eventually diseases the foot. I rasp the heel of the hoof about a sixteenth of an inch lower than level to prevent corns. R. R. H.

**Founder and Interfering.**—I will give "Sawyer" my experience in treating a foundered foot, that bulged down in the centre. The worst case I have treated was bulged down so that it was impossible to concave the shoe enough to prevent it from resting on the sole, before it came in contact with wall. And the sole of the foot was so thin you could draw blood with your thumb nail. So I came to the conclusion that we would have to get some weight on the sole to prevent further bulging. I used one-half-inch square iron, making a bar shoe to fit nicely around wall, without touching the sole. Just a plain shoe, without toe or heel calk. Then use a good leather pad under the shoe, to protect the sole. I kept the foot as short as possible and used this shoe for three drivings, or about six months. Of course, the horse was worked on the farm, and not on roads, unless they were muddy or very smooth.

The horse is now wearing an ordinary shoe, and has as nice a foot as the usual run of horses. The putting of the weight of the horse on the bulged part of the foot, will cause it to thicken up, and go back to its usual shape. In one or two cases, after shoeing this way, the bulged sole became dead and dropped out entirely and the foot assumed its normal shape.

In regard to Garnet E. Rowes' interfering horse, that is, toe wide, I have been very successful with the toe-wide interferers. I use a side weight shoe, with weight on the inside of the foot with a long laid calk on the side. I am also very particular to turn the toes of the feet in to match, as much as they will stand, every time I shoe them, until I get them straight.

I have been one of the craft for twenty years. Have as a side line, a full line of groceries, flour, tobacco, candy and notions. Some of the prices we get here are:

New shoes per set .....	\$1.46
Bar shoes per shoe .....	.50 to .75
Resetting shoes per set .....	.50
Resetting tires per set .....	2.00
New buggy tires per set .....	5.00 to \$6.00
Wagon axles .....	2.50 to 3.50
Wagon Tongues .....	1.50 to 2.50
Wagon Hounds .....	3.00 to 4.00
Wagon Bolsters .....	1.00 to 1.50

The other work is in proportion. There is another smith within half a mile of me, who is driving:

New Shoes per set .....	\$1.00
Redriving Shoes per set .....	.40
Resetting Tires per set .....	1.00

And so on. But I have not cut prices to meet his, nor do we have any time to loaf. I have been taking THE AMERICAN BLACKSMITH for one year only, but do not think I can get along without it, as I find so many helps and hints, of every kind for one of the craft. M. M. ARTMAN

**A Short Pointed Talk from Virginia.**—I commenced business here 3 years ago and last year built a new shop, a house and a barn. I have all new tools; two blowers, two Trenton anvils, one post drill, one No.

3 Stodard tire shrinker, one tire bender, one cone or mandrel, one set full mounted screw plates, one Porter bolt clippers, a full set of horseshoeing tools, two blacksmith vises, and all necessary small tools for working wood or iron. I extend credit to most anybody, but if the person's reputation is not what it should be I require some security. The way to succeed, I have found, is to buy close, pay your debts, make other people pay you and spend your time in the shop. Be courteous to every one, whether a customer or not. This costs you nothing and has a tendency to make friends and draw trade. Don't cut prices for they are already too low. Smiths in all places should agree to maintain living prices for their work and not cut under to get a job away from a neighbor. The smith who cuts prices is usually the one who moves soon or goes out of business. We had a smith in our vicinity last spring who cut prices. He paid 5 cents a piece for spokes and put them in for 8 cents, and other work was along the same line. This man has no business now, but works for someone else. Always remember that when the smiths cut prices, the smiths are the ones to suffer. So do good work and charge a living price for it. The public do not expect you to work for nothing and if you do, it is your fault and not theirs.

Read THE AMERICAN BLACKSMITH. It will give you lots of help during the year and repay you many times for the little you paid for it. It puts you in touch with the manufacturers and jobbers of the things you must use. When you write to an AMERICAN BLACKSMITH advertiser, tell them you saw their ad. in THE AMERICAN BLACKSMITH. This will ensure you a quicker reply and often, better prices on goods and machines. For the dealers and manufacturers have an impression that an AMERICAN BLACKSMITH reader is an up-to-date sort of man and is wanted for a customer because his wants are larger than those of the plodder who is content with a scrap heap for his material and an antiquated bellows and old anvil for his tools. I don't say, reading THE AMERICAN BLACKSMITH will make a blacksmith of the man who never was a smith, but I do say it will help any smith, for no smith yet knows it all and to the one who thinks he does, the door of advancement is closed. It gives the smith many a lift on how to do quicker and better work, for it puts him in touch with the best talent and best experience. E. H. BAKER.

An Interesting Letter from Kansas.—I started here three years ago with nothing, borrowed money to buy my first tools which consisted of a bellows, anvil, old fashioned screw plates and other small tools, costing about \$50.00. I added new tools as I could, but I had a hard time getting started, as my predecessor was not a first class workman and had cut prices in order to get work. The shop floor was about three inches deep with dust and a pile of stones for a forge and every surrounding suitable to driving away trade to the other shops, which were plenty. I am in a German settlement 13 miles from a railroad, but by doing good work with what few tools I had, I continued to win new and lasting customers and was enabled by hard work, to steadily advance. I installed a barber chair, which I ran at night. I also gardened quite a little the first and second year. I also put in a harness repair

bench and with them all I was able to draw trade. Last fall, the man who ran the shop east of me, and my hardest competitor, changed his location. The man north concluded his shop did not pay and went to farming. Another one quit and hired to the one which now runs the west shop. The man who was running this shop sold out last fall to a farmer boy, without experience, who engaged the northwest man to help him out, and I noticed while I was at work this Spring "taking money out of the fire," as the saying goes, that one of my competitors was out trying to sell a few farm implements, while I had so much blacksmith work I had to cut out the harness repairing and shoe work entirely and to cut my barber work to Saturday nights only. I also reduced my gardening to just enough for home use. I have a 3-horse International gas engine, a band saw, an emery stand, a Universal spoke tenoning and boring machine, a tire bolter, a press drill, a lathe, a blower, power hammer and a good supply of small tools and stock and owe only about \$500. Now this is what I call the fruit of success, picked from the tree of progress tilled by the tools of perseverance, raised from the seed of a fair price planted in the soil of good work.

A few words about my work, customers and my method of getting and holding trade. My motto is: "Work worth doing is worth doing well". I have had men bring in work and tell me to fix it up in a hurry and not take so much pains with it, but I tell them that they had made a mistake, that they have come to the smith who fixed things right. My customers at first kicked on my prices and said they could get work done at the other shops cheaper, but I told them that cheap prices brought cheap work and if they wanted my work they would have to pay my prices to get it. My method of getting trade is to let my customers do the advertising. Of course I advertise, but I find a well satisfied customer is the best ad. a man can have. I tell customers that if a tool or machine does not run right after I fix it to come back and I will also pay them for their time. I know they will come back but not for their money. A man to be a good working man at any trade must be a good reasoner and calculator and understand cause and effect. Now I have had men bring jobs to me and I would tell them that I could not fix them that day. They would have to leave it simply because it was out of the ordinary line and I wanted time to study the cause and effect. Now I have learned by experience that it does not pay to undertake to do a job until you thoroughly understand it. Is that not your experience brother smiths? J. W. SMITH.

Interesting Prices from Illinois.—I started to learn the trade about eleven years ago under a good smith and wheelwright. I served four years apprenticeship and then journeyed four years learning different ways of doing the same thing. When I served my apprenticeship I thought I knew it all but after I had worked in different states awhile, I found I didn't know a b c about it. I have been in my present location three years. This is a little town of 500 inhabitants in a good farming country. I came here as a stranger, I looked around the town a few days and visited the blacksmith. He told me he was not doing any-

thing. This I could easily see. He said there was no work, that it was all going to other towns but he did not know why. It was nine miles to any other shop, a good farming community and land worth \$100 per acre. That was why. I therefore rented a shop, bought a few tools and went to work and made tools in my idle time. That did not last long however for I got an apprentice in six months and now the work keeps both of us going.

I bought a shop a few days ago 32 by 48 feet and will move into this soon. During the slack times, which we all have, I build wagons and sleds. Will give a few of our prices here:

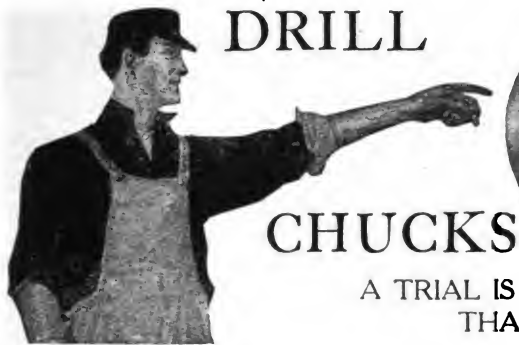
Shoeing stallions, per shoe.....	\$1.00
Bar shoes, each.....	.75
All other hand-made shoes, each....	.50
Four factory shoes.....	1.50
Resetting four shoes.....	1.00
Pointing cultivator shovels per set...	2.00
Pointing plows, each.....	.75
16-inch solid bottom plow share....	4.00
12-inch slip share.....	2.50
Patching mold board.....	\$1.25 to 1.50
Laying corn planter runners.....	2.50
Wagon tire, set of four.....	2.00
Buggy tire.....	2.00
Buggy tongue.....	2.50
Buggy shaft.....	1.25
Wagon axle, front \$3.50. hind.....	3.00
Wagon tongue.....	2.50
Tongue hounds, each.....	.75
Bolster.....	1.25
Sand board.....	.75
Buggy rims.....	1.00
Filing and set saws of all kinds.....	.25
Hand made clevises.....	.20 to .25
Hand ironed single trees.....	.50
Neck yoke.....	1.00

Well, as far as fast work is concerned, I am not very fast. If I get three solid-bottom plow shares on in one day or four slip shares, I am satisfied. I point five sets of shovels in a day, or point 10 plows in a day. I am then willing to quit and go home to read THE AMERICAN BLACKSMITH and let brother McCoy do the fast work.

Regarding tools: If I want a tool I want a good tool, and as it is hard to get it in the hardware store, I make it. I have nine hammers of different weights. These I made when I was in the third year of my apprenticeship.

My apprentice has made and sold 100 butcher knives for me this winter. I will tell you how we make them. Take a narrow bladed cross-cut saw, heat and anneal and cut into strips 1½ by 10 inches long, allowing for handle. If you want a crooked knife, draw the edge down and the blade will spring back far enough to make the knife. If a straight blade is wanted, heat and bend on the edge that you draw about 5 degrees, then draw the edge and it will just about straighten. Now heat the full length 2 or 3 times, lay on the anvil and take the hammer, rub back and forth to remove kinks. Then heat, cool and drill hole for handle. To temper, heat to a yellow, plunge point down in oil and leave until cooled. Straighten and grind as soon as it comes out of the oil. When it is cold it will cut glass. Now draw over a hot iron until a light blue, unless the carbon is too high. If this is high draw to a green. When the carbon is high the blade will drill hard. D. A. SPARKS

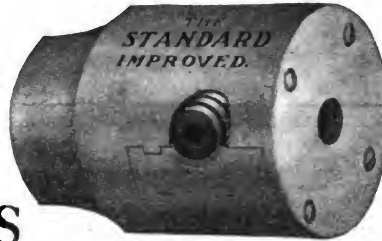




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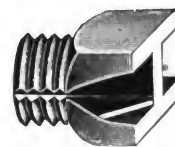


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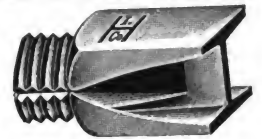
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**Prices Current—Blacksmith Supplies.**

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All prices, except on the bolts, are per hundred pounds. On bars and flats prices are in bundle lots.

**Bars—Common Iron and Soft Steel.**

$\frac{1}{2}$ in. round or square; Iron, \$2.80; Steel, \$2.80	
$\frac{3}{4}$ in. " " " 2.40 " 2.40	
$\frac{1}{2}$ in. " " " 2.20 " 2.20	

**Flats—Bar and Band.**

$\frac{1}{4}$ x 1 in., Iron, \$2.40; Steel, \$2.40	
$\frac{1}{4}$ x $\frac{1}{2}$ in., " 2.50; " 2.50	
$\frac{1}{2}$ x $\frac{1}{2}$ in., " 2.50; " 2.50	

**Norway and Swedish Iron.**

$\frac{1}{4}$ in., round or square, \$4.90	
$\frac{3}{4}$ in., " 4.50	
$\frac{1}{2}$ in., " 4.90	
$\frac{1}{4}$ x 1 in., " 4.90	
$\frac{1}{2}$ x $\frac{1}{2}$ in., " 4.20	

**Horseshoe Iron.**

For No. 1 shoe, $\frac{3}{8}$ x $\frac{1}{2}$ in., \$2.50	
For No. 2 shoe, $\frac{1}{2}$ x $\frac{3}{8}$ in., 2.50	
For No. 3 shoe, $\frac{5}{8}$ x $\frac{1}{2}$ in., 2.50	
For No. 4 shoe, $\frac{3}{4}$ x $\frac{1}{2}$ in., 2.50	

**Toe Calk Steel.**

$\frac{1}{2}$ x $\frac{3}{8}$ in. and larger, \$3.00	
--	--

**Spring Steel.**

$\frac{1}{2}$ to $1\frac{1}{2}$ in. Rounds, Op. Hearth \$3.00, Crucible \$5.00	
$1\frac{1}{4}$ to 6 in. by No. 4 gauge to $\frac{1}{2}$ in. Flats, 8.00, " 5.00	

**Carriage Bolts. (Net Price per Hundred).**

$\frac{1}{4}$ x 2 in., \$0.54	$\frac{3}{4}$ x $2\frac{1}{2}$ in., \$0.82
$\frac{1}{4}$ x $2\frac{1}{2}$ in., .58	$\frac{5}{8}$ x $3\frac{1}{2}$ in., .96
$\frac{1}{4}$ x 3 in., .62	$\frac{1}{2}$ x 4 in., 1.81
$\frac{1}{4}$ x 4 in., .65	$\frac{3}{4}$ x 4 in., 1.70
$\frac{1}{2}$ x 2 in., .75	$\frac{1}{2}$ x 6 in., 2.10

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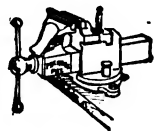
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**FOR SALE**—Up-to-date blacksmith shop, stock and tools. Address, **LOCK BOX 392, Tarkio, Mo.**

**FOR SALE**—Schau Cold Tire Setter. For full particulars address **W. H. SIEBERT, Flaxton, N. D.**

**FOR SALE**—Blacksmith shop and tools; work for two men; write for information. **J. E. MAYS, Almena, Barron County, Wisconsin.**

**BLACKSMITHS**—If you want to know how to braze cast iron, write to **G. A. TOPPINGS, Le Mars, Iowa.**

**FOR SALE**—Blacksmith and wagon shop, and complete equipment. For full particulars write to **THOMAS BALL, Fairland, Indian Territory.**

**FOR SALE**—One No. 0 West's Hydraulic Tire Setter in first class condition. A bargain for anyone engaged in repair work. **PONTIAC SPRING & WAGON WORKS, Pontiac, Mich.**

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**FOR SALE**—Blacksmith and wood shop, house and two lots, stock and tools for sale cheap. Address **BOX 72, Belleville, Wis.**

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**FOR SALE**—Brooks Cold Tire Setter No. 2, in first class condition. A bargain for the right party. Address **J. MILTON ACHENBACH, Lebanon, Pa.**

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**FOR SALE**—Blacksmith shop in good inland town in Minnesota. Shop two stories, with addition for wagon shop; engine room connected. All necessary tools and stock. Cash trade. Profitable and growing business. Blacksmith and wagon shops in many States. See our ad. in this paper for March, page 30. **HILES & MYERS, A 25 Matthews Bldg., Milwaukee, Wis.**

**FOR SALE**—Horseshoeing and paint and carriage shop at a price whereby a man can clear it the first year. Established 25 years and employs 4 men at shoeing, 3 men at carriage work and from 3 to 6 men in paint shop. Owner wants to go west before first of July. A snap for a good live man. Address **P. N. L., Care of American Blacksmith, Buffalo, N. Y.**

**FOR SALE OR RENT**—Modern up-to-date shop, 50 ft. x 100 ft., two stories high, 10 H. P. Weber engine and complete equipment of tools and machines. Located in prosperous city. Established trade. Guarantee a good man can make over \$2,000 per year above all expenses. Will make easy terms of payment. Owner must retire on account of health. For full particulars address **GOOD SHOP, Care American Blacksmith, Buffalo, N. Y.**

**FOR SALE**—Well equipped shop, 60x24 feet, and 2½ stories high. Constructed entirely of stone. Two lots joining shop. Good location in prosperous town and plenty of work the year round. Address, **HENRY WINTERS, Waterville, Kansas.**

**MAKE YOUR OWN HORSE STOCKS**—Send \$1.00 to P. P. Greene, Lenepah, I. T., and get complete plans and drawings to make stocks to hold any horse tight and fast. You make every part. Little cost, no danger, build indoors or outdoors. Any one can build it. Save your back and money. No fake.

**PATENTS**

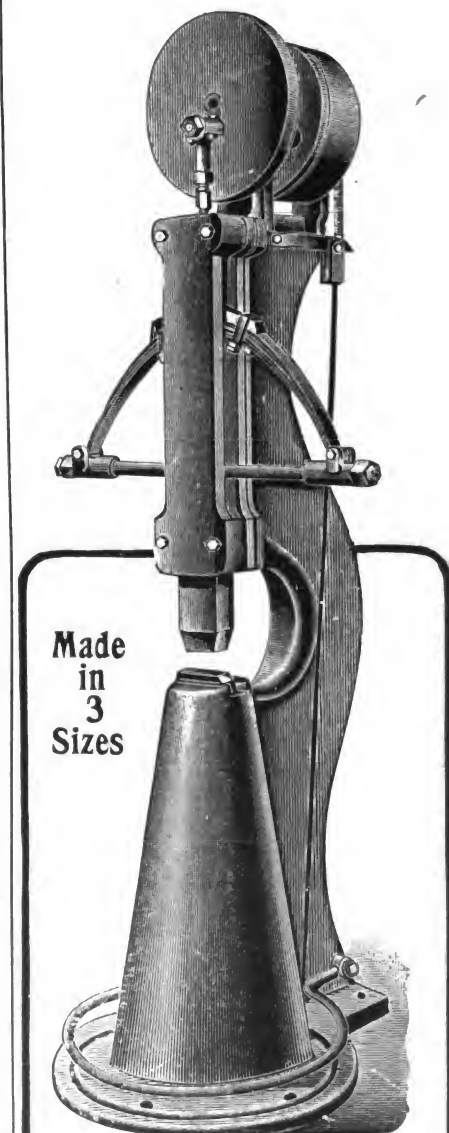
Herbert Jenner, patent attorney and mechanic expert, 608 F St., Washington, D. C., established 1883; I make an examination free of charge and report if a patent can be had; also the exact cost. Send for circular.

**PATENTS**

Send sketch or model for free examination and report as to patentability. Patents promptly secured. Advice free; terms low; highest references, and best service. Address,

**WATSON E. COLEMAN,**

Registered Patent Attorney, WASHINGTON, D. C.

**The Perfect Power Hammer**

has no equal for simplicity and efficiency. Does a wide range of work from the lightest forging to heavy axle welding. Note the long guides, insuring a direct vertical stroke. No side motion. Easy to operate from the lightest tap to the heaviest blow. The Disk Attachment free. No other Hammer has this advantage. It only requires one Horse Power to run it. Write for prices.

**Macgowan & Finigan Foundry & Machine Co.**  
ST. LOUIS, MO.

# LONE STAR

## Brazing Holder

### AND COMPOUND

#### MAKES BRAZING QUICK AND EASY

By using this machine you can lift your work from the fire as soon as it is brazed, causing no loss of time. The machine is adjustable to any peculiar shaped casting or machinery to be brazed. As every repair man knows, brazing is comparatively a failure the old way. Don't waste your time and wear your life away trying to braze the old way. The Lone Star Holder holds them all alike and you never lose your work in the fire as you have done many times the old way. You can have the amount of tension required to hold your work. Either light or heavy work may be done with this machine and it will give to the expansion caused by the heat and save the most delicate work from buckling while brazing.

You get a full supply of Compound with each holder, enough to do \$50 to \$100 worth of brazing. **CASH PRICE, \$10 WITH ORDER.** Send in your order or write for further particulars. Sold on an absolute guarantee.

**LONE STAR BRAZING COMPANY,**  
—KRUM, TEXAS—

## Something to Notice.

Instead of being able to use the dies (four to a set for each diameter) for our tools for just the diameter marked on them, one



can thread

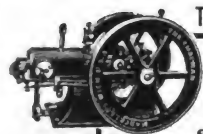
"DUPLEX" DIE STOCKS.

two or three besides, because of their wide adjustability, thus covering several over sizes and a little under size.

Manufactured by

**THE HART MFG. CO.**

50 Wood Street,  
Cleveland, Ohio, U. S. A.



### THE CHAPMAN STARTS EASY

Drives trip hammer, iron lathe and drill presses all at same time.  
Safe, Strong, Durable, Economical  
SENT ON TRIAL—EASY TERMS  
Write for Circular A. B.  
H. L. CHAPMAN, Marcellus, Mich.



## "BOSS" Leather Aprons

THEY Outwear Six of the Ordinary Kind.

**STRONGEST and most DURABLE.**

### ASK YOUR JOBBER

For the "BOSS" Leather Apron. If he cannot supply you, send order to us. On receipt of price we will ship a perfect "BOSS" Apron, prepaid, or will send it by Express, C. O. D., giving you the privilege of examining it. If it does not meet every requirement, return at our expense.

#### PRICES.

"The Boss,"	"The Boss" with Bib
Size X, 30x36 in. \$1.50	Size D, 30x42 in. \$1.75
"A, 26x33 in. 1.25	"E, 28x38 in. 1.50
"B, 24x30 in. 1.10	"F, 26x34 in. 1.25
"B, 24x27 in. .85	

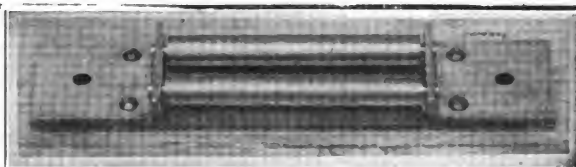
**EDMUND C. BECKMAN,**  
Sole Manufacturer,  
712 N. Fourth St., ST. LOUIS, MO.

## ROLLER REACH IRONS

Fill a long felt want, as they prevent the

hounds from wearing into the reach. Can't wear out.

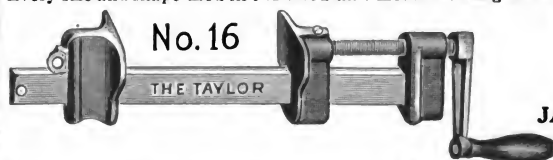
\$2.00 for 10. **W. T. Daum & Bro.,** 146 W. Lake St. Chicago.



## TAYLOR CLAMPS.

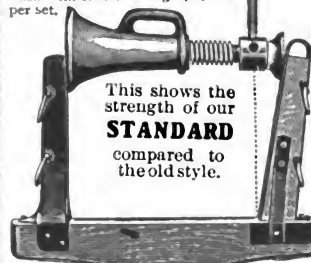
Quick-Acting, Self-Locking.

Every size and shape used in the wood and metal working trades.



Get our Catalogue before placing your next order.  
**JAMES L. TAYLOR MFG. CO.,**  
Bloomfield, N. J.

We make the following sizes:  
No. 1, 3 in. wide, 14 in. high  
" 2, 3 1/4 " 14 "  
" 3, 3 3/4 " 10 "  
Price, \$1.65 per set of 4 stks  
Cash with order. Weight, 16 lbs. per set.



This shows the strength of our **STANDARD** compared to the old style.

## The Bruce Malleable Wagon Standard

This Malleable Iron Bolster Standard has been tested thoroughly, and we guarantee it strictly as represented.

Anyone familiar with the farm wagon will readily see the great advantages of the Malleable Iron Bolster Standard over the old style.

1. Made of the best grade malleable iron. It has been thoroughly tested by factories and wagon makers and pronounced a great success.

2. It is attached to bolster by means of two bolts passing through bolster from the side, and one bolt from top to bottom of bolster, thus holding standard perfectly solid, and at the same time strengthening end of bolster, which in old style is weakened by moitise.

3. The Malleable Iron Standard has a 3 1/2 in. face at base, which prevents wear on wagon box, while the old style has only a 7-8 inch face.

4. Great time saver. Can be attached to bolster in one-fourth the time required to put on wood stake. Adapted to new and repair work. The price will justify all classes of the trade in using this standard.

**A. H. HARSHBARGER, Bement, Ill.**



## GROLOCK VEHICLE MATERIAL CO., ST. LOUIS, MO.

Blacksmith and Wagon Makers' Materials and Supplies

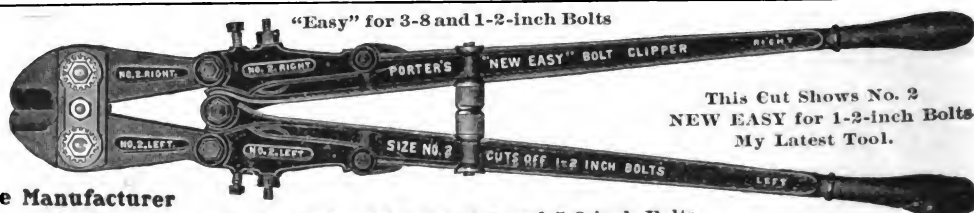
**"OUR SALESMAN FOR 1906"**

Containing lowest Net Cash Prices, now ready for mailing. Send for copy at once



## PORTER'S THE BEST BOLT CLIPPERS

**H. K. PORTER, Sole Manufacturer  
EVERETT, MASS.**



"Easy" for 3-8 and 1-2-inch Bolts

This Cut Shows No. 2  
NEW EASY for 1-2-inch Bolts  
My Latest Tool.

### HIGH-GRADE BUGGIES

**\$47.50  
AND UP.  
Dealers  
Only.**



Strictly  
First-  
Class  
Material.

**JAMES & MEYER BUGGY CO.**  
Write for Catalog and Prices. Lawrenceburg, Ind.

It's the  
**SPARK**  
that  
Counts



Ignite your engine with our  
**IMPROVED I. C. C.  
JUMP SPARK COILS**  
We guarantee them against all imperfections in workmanship  
and material. Write us if your engine doesn't work properly.  
**INDUCTION COIL CO.,**  
COILS FOR BLACKSMITHS. MILWAUKEE, WIS.

### Can YOU Braze Cast Iron?

One of our customers writes: "I saw your 'ad' and showed it to a man in the shop. He said cast iron could not be brazed, so to prove it to him I sent for a sample of Braziron and gave it a trial; it worked fine; it is just the thing for brazing cast iron and I recommend it."

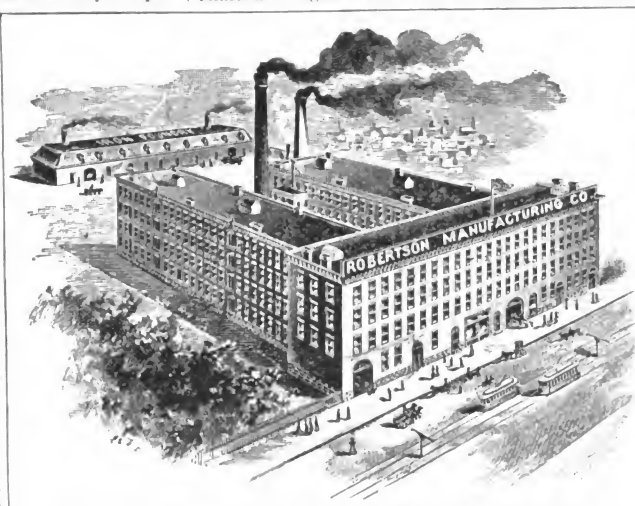
Name and address on application. Try it yourself. Send us ten cent stamps and we will mail you samples of Braziron, flux and spelter sufficient for several jobs.

**THE A. & J. MANUFACTURING CO.,**  
18 W. Randolph St., Chicago, Ill.

### Trade Literature and Notes.

THE ACCOMPANYING ENGRAVING shows the new home of the Robertson Mfg. Co., Niagara St., Buffalo, N. Y., makers of the Robertson Straight Line Gas and Gasoline Engine, Metal Cutting Saws, Drill Presses, Emery Grinders, etc. The growth of this concern in the past few years is worthy of special mention. This Company formerly manufactured emery grinders and metal cutting saws, having for their motive power gas engines to run the machinery. The power was very satisfactory, admitting of course that there has been great improvement in gas engine construction since the first one bought by Mr. Robertson of this company, 18 years ago. In all he has owned seven different makes of gas engines. The same weak point and excessive wear showing on all, viz., the cylinders wore by the action of the crank to the direct connected trunk type piston. About three years ago Mr. Robertson, who is a practical mechanic, decided that the straight line piston with crosshead would eliminate this trouble. Being a believer in tests for records, rather than theory, an engine was designed and built and run for months. It proved satisfactory in every respect and now has an enviable reputation for efficiency, smooth running and handsome design. As will be seen on the front cover of this issue, the single cylinder design, using the crosshead, necessitates the base longer than a direct piston connected engine, but from a mechanical standpoint this might be considered a good improvement in itself and, with the straight line feature, it without a doubt has many advantages. The general principle of the gas engine construction has been closely studied to attain the highest efficiency with the greatest economy, having large valves and uniform bore with the stroke. The regulation is a very simple governor and electric ignition is used. In this, it is said, the efforts of the company and their experts have been rewarded by being able to place a system of igniting the charge under all conditions without fail at the right time, and it is always there when wanted.

This company is now preparing a new pamphlet relating to this feature of their engine. Our readers will receive a copy on request. These engines are made in single cylinders from 4 to 15 H.P.; double cylinders from 20 to 40 H.P. Every part, it is claimed,



The New Home of the Robertson Manufacturing Co.

forged, solid without weld. The cylinders and valve cases are of a fine grade iron, full water jacketed, with provision for drain and no freezing. The gas engine department is located on the ground floor, north half. The iron foundry is located in the rear. The machine shop has two lines of main shaft to which the counter shafts are belted, and are located in convenient arrangement. Long lines of planers, lathes, drills, boring machines, shapers, milling machines, etc., are operated by a force of good mechanics. The whole floor space has a cement foundation and a plank flooring, except in the testing department, which is a row of cement blocks. On these every engine is mounted and run under test before shipping and a record is taken for the files.

The Robertson Manufacturing Company claims that a well pleased customer is the best friend to have, and by putting out a high-class article the battle is won.

### HELLERS' CELEBRATED AMERICAN HORSE RASPS FILES AND FARRIER'S TOOLS

will save you Time and Money. Their Superior Quality sets a known and tested Standard of Excellence. All made from our own Production of Special Refined Clay Crucible Steel and tempered by a Secret Process. New Catalogue Mailed Free on Application.



"Tools That Wear"

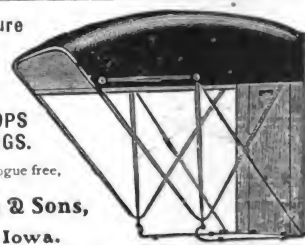
"H. P. DRIVING HAMMER."

**HELLER BROTHERS CO., Newark, N. J., U. S. A.**

We Manufacture  
a Complete  
Line of  
**CARRIAGE TOPS  
and TRIMMINGS.**

Illustrated catalogue free,  
Write to-day.

**D. A. Laros & Sons,**  
Grinnell, Iowa.



## BEST ROUTE To the Northwest.

**Chicago, Milwaukee & St. Paul Railway**

In going to St. Paul, Minneapolis or the Northwest see that your ticket west of Chicago reads via The Pioneer Limited on the Chicago, Milwaukee & St. Paul Railway—the route over which your letters go. Standard and compartment sleepers with longer, higher and wider berths. Leaves Union Station, Chicago, 6.30 p. m. daily; arrives St. Paul next morning at 7.25 and Minneapolis at 8.00 o'clock.

## GO NOW TO CALIFORNIA.

Via The Overland Limited on the Chicago, Milwaukee & St. Paul Railway. Less than three days en route. No change of cars. From Union Station, Chicago, at 8.00 p. m. daily. Descriptive folder free.

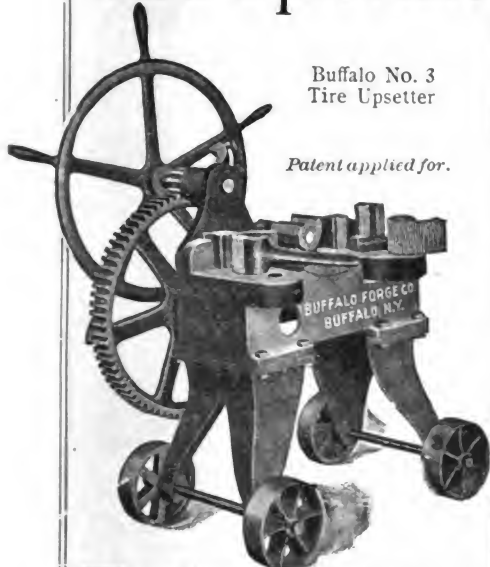
**F. A. MILLER,**  
General Passenger Agent, Chicago.



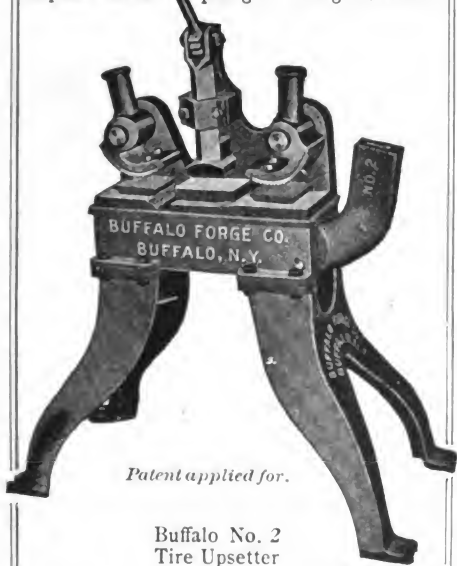
## Buffalo Tire Upsetters

Buffalo No. 3  
Tire Upsetter

Patent applied for.



THIS is a high power machine designed for the heaviest tires. It is of the edge grip type operated by a windlass through reduction gears. Grips have a throw of  $1\frac{3}{4}$  in., which, with the ten to one reduction gears, enable a force of a ton to be brought on the work with less than ten pounds pull on the wheel. Grips are faced with tool steel which is properly cut with full, sharp teeth which will not become battered and lose their holding qualities in service. It has a removable anvil piece same as the No. 2 style and a removable cam in place of the plunger. Weight 900 lbs.



Patent applied for.

Buffalo No. 2  
Tire Upsetter

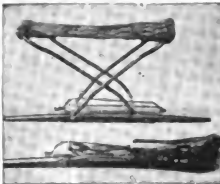
THIS machine upsets  $3 \times \frac{5}{8}$  tires and axles up to  $1\frac{1}{2}$  in. square. Grips are faced with tool steel with teeth carefully cut and tempered. Lower grips adjust themselves automatically to curvature of tire or for straight work. Upset both straight and curved work. The plunger prevents all buckling or kinking. Weight 275 lbs. Height 22 in. Write for circular.

**BUFFALO FORGE CO.,**  
BUFFALO, N. Y.  
The Canadian Buffalo Forge Co., Montreal.

### Automobile Material and Tools

at half price and less. We have just bought all the material and tools from a local factory (who have discontinued the manufacture of automobiles) at less than 50c. on the dollar. This is all first class brand new stuff and if not satisfactory you can return.

38 Automobile Bodies, \$5.00 to \$15.00.  
5 Angle Iron Automobile Frames, \$5.00.  
46 Sta-Rite Spark Plugs, 75c.  
500 lbs. Short Pieces, High Grade Tool Steel, 10c. per lb.  
300 lbs. High Grade Welding Compound, 5c. per lb.  
50 lbs. Brazing Spelter, 2c.  
Aluminum Bronze Powder, 8c. per ounce.  
Gold Bronze Powder, 5c. per ounce.  
3, 2 H. P. Gasoline Engines at a Bargain, 2, 4 H. P., one 1 H. P., one 10 H. P. Engine.  
300 feet  $1\frac{1}{4}$  in. Rubber Belt 2c. per foot, 400 feet,  $1\frac{1}{2}$  in. Rubber Belt, 3c. per foot, 200 feet 2 in. Rubber Belt, 4c. per foot.  
1,000 Taps at half price, 12 Small Taps, no two alike, 75c.  
12 Small Drills no two alike 50c.  
12 assorted Files, no two alike, 75c.  
50 Stillson Pipe Wrenches, 6 in. 50c., 8 in. 60c., 10 in. 70c., 14 in. 89c.  
12 Malleable Hinge Pipe Vises, \$1.33.  
6,000 feet Iron Pipe,  $\frac{1}{8}$ ,  $\frac{1}{4}$ , or  $\frac{3}{8}$  in., 2c.  $\frac{1}{2}$  in.,  $2\frac{1}{2}$ c.  $\frac{3}{4}$  in.  $2\frac{3}{4}$ c. 1 in.  $3\frac{3}{4}$ c.  
Better order quick, as assortment will soon be broken. Do you want our Job Lot List?  
**WESTERN TOOL CO.,**  
Lansing, Mich.



Seat Folded.

### THE ITHACA THIRD SEAT Price \$1.50

Will allow the Third Person, and the occupants of a Buggy or Cutter Seat, to ride with ease and comfort.

Try one and be convinced that we have the only Third Seat made that will sit steadily on a spring cushion. The only one wide enough for an adult to ride with comfort. (14 inches wide).

To have the Seat well advertised, for the Spring Trade of 1906, for the next sixty days we will ship by express, to any dealer or blacksmith, one of our Seats, on receipt of 85 cts. (Eighty-Five Cents).

Manufactured by

**THE ITHACA CARRIAGE CO.,**  
ITHACA, N. Y.

## WHY DOES A MAN GO TO A TAILOR?

To get a suit that's made for him.

When you buy a set of Dry Batteries for ignition, get cells that are made for ignition, "16 Acmes."

The name spells Quality with a capital Q, and quality counts.

The  
NUNGESSER  
ELECTRIC  
BATTERY CO.,  
Cleveland,  
Ohio. U. S. A.

General  
Sales  
Office,  
128 W. Jackson Blvd.,  
CHICAGO.



## WELD YOUR BROKEN FLATTERS

Hundreds are doing it, why don't you? It requires no change in method or special equipment of any kind, for you simply use

## LAFFITTE WELDING PLATES

Besides this is only one of a thousand things you can do but are not doing.

Welds at a Low Heat.

Saves 33% in Time and Fuel.

Send for sample, no charge.

For sale by all dealers.



Upon receipt of \$1.00 we will send prepaid 6 full sized plates as a sample order.

**THE PHILLIPS-LAFFITTE CO.,**  
Pennsylvania Bdg., PHILADELPHIA, PA.

## A TURN FOR THE BEST

Every dealer turns profits his way when he takes on a line of

### EUREKA VEHICLES

Everything that goes into them is the best we can buy or make. This means that your customers will be pleased with them. You will get compliments instead of complaints.

Easy to sell because quality is high and prices are low. Profitable because quickly sold on liberal margin. Write to us and let us tell you.

Wheels in the white or finished complete, with or without rubber tires. Buggy Tops in all sizes, grades and prices.

### LOOK UP



**New Eureka  
Carriage and  
Harness Co.,**  
CINCINNATI, O.

Address H. A. BEHAN, Manager.

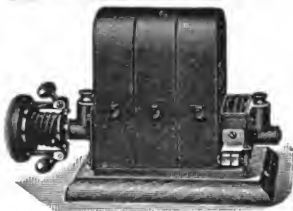
**DEATH TO HEAVES! NEWTON'S**  
 GUARANTEED  
  
 Heave, Cough, Distemper and Indigestion Cure will effect a permanent cure for the ailments named. Recommended by veterinarians and owners. Every druggist in America has it or can get it.  
 Send for Booklet.  
 \$1.00 per can, of dealers, or express prepaid.  
**THE NEWTON REMEDY CO., TOLEDO, OHIO.**

**CLARK'S** DOUBLE ACTION 8 FT. CORN HARROW  
 NO MORE USE FOR PLOW  
 SEND FOR CIRCULARS  
  
 CUTAWAY HARROW CO.  
 INDIANAPOLIS, IND.  
 U.S.A.

## HOTTEST ON EARTH.

**No. 92**  
  
 Double Jet Torch  
 For Brazing Wires on Rubber Tires  
**GUARANTEED**  
 Jobbers sell at Factory Prices, \$4.50 net

**THE TURNER BRASS WORKS**  
 63 No. Franklin St. CHICAGO, ILL.



## HENRICKS MAGNETO

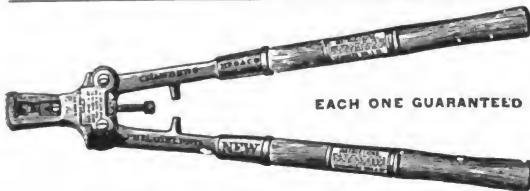
*Fires your gas or gasoline engine without the aid of batteries.*

It is better and more durable than any Dynamo. Its Governor regulates the speed regardless of speed of Fly Wheel. Its Governor adjusts to imperfect Fly Wheels. Its Governor insures a constant and uniform spark. The spark does not burn the contacts of the engine. All strains are removed from the bearings of Magneto. FULLY GUARANTEED. AGENT'S WANTED.

## HENRICKS NOVELTY CO.

135 S. Capital Avenue

INDIANAPOLIS, IND.



EACH ONE GUARANTEED

## BOLT CLIPPERS

**CHAMBERS BROS. CO.,**

N. Fifty-Second Street,

Philadelphia, Pa.

## Solid Tire Applying Machines.

For applying internal and side  
**WIRE TIRES.**

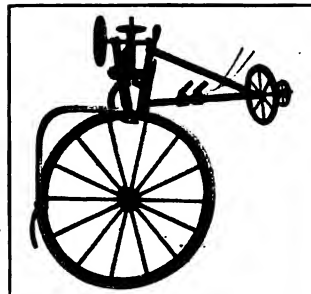
Special Machines built to order.

Write for new, illustrated Catalogue, just out, describing our complete line.

**NELSON AND LE MOON,**

105-107 SO. JEFFERSON ST.,

CHICAGO, ILL.



The Original Internal Wire Applying Machine.

**HAND FORGED**

**A GOOD SIDE-LINE**

Hundreds of blacksmiths are making large profits by selling these blades. Each one is fully warranted. Made of Sanderson Steel. Round or riveted. All sizes from 5 to 8 inch. Handles ready to put on, 1c each.

Hand Forged Razors, ready to use, 40 cents each.  
 Pocket Knife Handles in variety, 10 cents each. Send for sample.

**WOODWORTH KNIFE WORKS, NUNDA, NEW YORK**

**BUTCHER KNIVES**

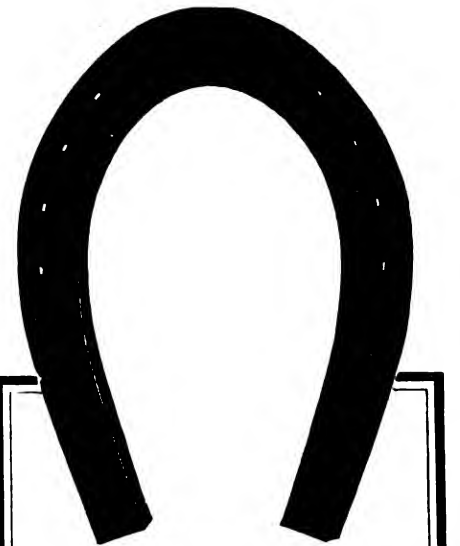
**\$ .15 EACH  
 \$ 1.50 DOZ.**

**SPAVINOFF CURES**  
  
 Spavin, Ringbone, Grease Heel, Sweeney, Windgall, Enlargements, Curb, Galls, Sores, Pollevis, Scratches, Shoe Bolls, &c. Removes unnatural growths and lameness, leaving flesh smooth and clean. Testimonials.  
**CHURCH BROS., AFTON, N. Y.**  
 \$1.00 per Box, by Mail. For HORSES AND CATTLE.

## GOOD SECOND-HAND GASOLINE ENGINES.

- |  |         |
|--|---------|
| 1, 1½ H. P. Witte gasoline engine. ....  | \$40.00 |
| 1, 1½ H. P. Webster gasoline pumping engine, with electric spark and torch, .....  | 60.00   |
| 1, 1½ H. P. Webster gasoline pumping engine, complete, with torch igniter only....   | 50.00   |
| 1, 2 H. P. Webster engine, complete, on combined base, electric spark and torch .....  | 60.00   |
| 1, 2½ H. P. Webster engine, torch igniter only .....   | 65.00   |
| 1, 3 H. P. Burrell vertical gasoline engine, with torch igniter and electric spark .....   | 75.00   |
| 1, 3 H. P. Webster gasoline engine, complete, set up on combined base, with water tank and oil in base, electric spark and torch ..... | 80.00   |
| 1, 4 H. P. Chicago gasoline engine, used 30 days, just as good as new, electric spark, all set up on combined base. ....               | 90.00   |
| 1, 4 H. P. Webster vertical gasoline engine, torch igniter only... ..  | 95.00   |
| 1, 5 H. P. Webster horizontal gasoline engine, run 30 days, with electric spark and torch; cannot tell it from new.....                | 190.00  |

**ALLEN P. ELY & CO., - OMAHA, NEB.**



## WHEN YOU BUY HORSE SHOES

Is it not preferable to make your selection from the most complete line and the best shoes on the market?

## UNITED STATES HORSE SHOES

**"In a Class by Themselves"**

OUR

Illustrated Catalogue shows all sizes and patterns. The book is free. We will gladly send a copy to your address. Write today

*and a pin*

We are giving away a handsome souvenir stick pin to every smith who sends his name and address. Did you get one? Don't wait until they are gone. Write today.

*and a pin*

**UNITED STATES HORSE SHOES**

— ARE SOLD BY —

**LEADING JOBBERS**

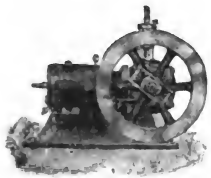
**EVERYWHERE**

*and a pin*

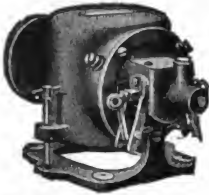
## United States Horse Shoe Co.

ROLLING MILLS  
 and FACTORY

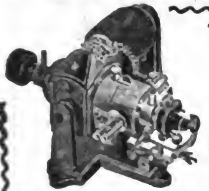
**Erie, Pa.**



The 1906  
**CUSHMAN**  
3 H. P. 150 lbs.  
6 H. P. 225 lbs.  
Simple, Durable.  
Free Catalogue.  
**CUSHMAN MOTOR CO.,**  
Lincoln, Neb.

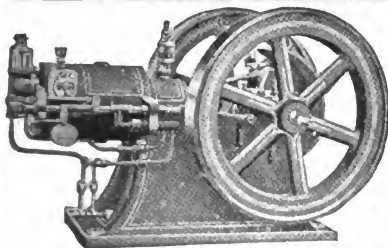


**Igniter Dynamos**  
For all Classes of  
**GAS ENGINES**  
for make and break or jump  
spark systems. Our latest type  
price \$15. Write for circular of  
magneto, etc.  
**THE CARLISLE & FINCH CO.**  
243 E. Clifton Ave.  
Cincinnati, O.



To Gas Engine Operators.  
Dynamo Ignition.  
**Motsinger**  
**Auto-Sparker**

No battery to start or  
run. The original speed-  
controlled friction-drive. Driven  
parallel with engine shaft. No belts. No beveled  
pulley or beveled fly wheel necessary. For make  
and break and jump-spark system. Water and  
dust proof. FULLY GUARANTEED.  
We have an attractive proposition for the Dealer  
in Gas Engine lines. Correspondence solicited.  
Write for 32-page catalogue, FREE.  
**MOTSINGER DEVICE MANUFACTURING CO.**  
32 Main Street, Pendleton, Ind., U. S. A.

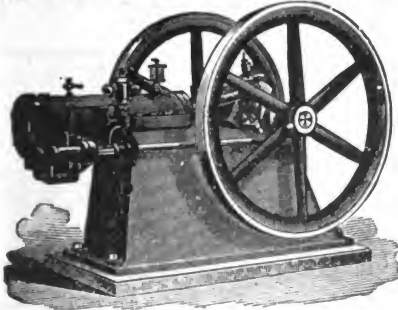


## MICHIGAN Three and One-Half Horse

A gasoline engine of full 3½ guaranteed  
horse power. In every way suited to general  
blacksmith and machine shop work. Relia-  
ble in construction and reasonable in price.  
Special price on first engine in any locality,  
and good terms for agents. Other sizes 2 to 6  
horse power for light power uses. Send for  
free book "Proof-Positive" shows how the  
engines are used and letters from the users.  
**The Nation Engineering Co.,**  
Saginaw, Michigan.

## COLUMBUS GASOLINE ENGINES

ARE THE THINGS FOR BLACKSMITHS



Send for Catalogue 33, Stating Horse  
Power You Need.

**COLUMBUS MACHINE COMPANY**  
Columbus, Ohio.



Style No. 6,  
Cyclone  
Portable  
Forge.

Easy  
Running.  
Powerful.  
Large  
Capacity.

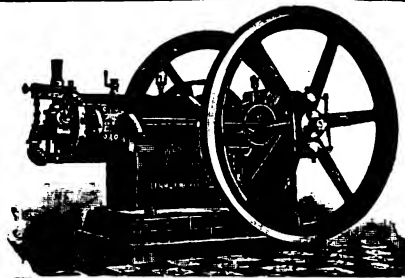
Our Free  
Catalogue  
illustrates  
more  
than 20  
other styles

## CYCLONE PORTABLE FORGE

The Cyclone Portable Forge, shown here, is a favorite every-  
where. Suitable for heavy, as well as light work. Has a 28x40  
in. hearth, large capacity coal box and a 14 in. fan. The deep  
firebox and powerful blast make the Cyclone Style No. 6 capable  
of doing the heaviest kind of work. The Cyclone has double  
Ratchet Adjustable Legs, Solid Frame, Detachable Lever hung  
on Ball Joint and swinging in chilled seat. FULLY GUARAN-  
TEED.

Write today for our FREE Catalogue and SPECIAL INTRO-  
DUCTORY PRICES.

**FOOS MANUFACTURING CO.,**  
28 Sheridan Ave. SPRINGFIELD, OHIO.



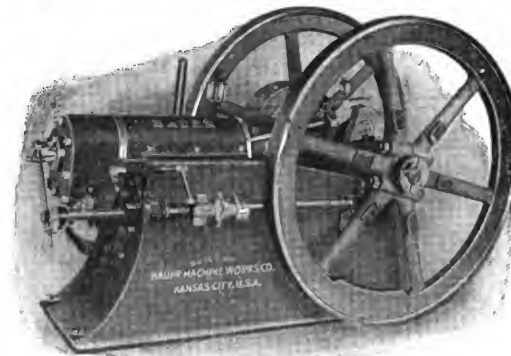
## Lennox Gasoline Engines

MADE IN ALL SIZES.

Built especially for **Blacksmith shop**  
power. It means money in your pocket to  
find out about our engines before placing your  
order.

WRITE AT ONCE FOR NEW FREE CATALOGUE.

**Lennox Machine Company,**  
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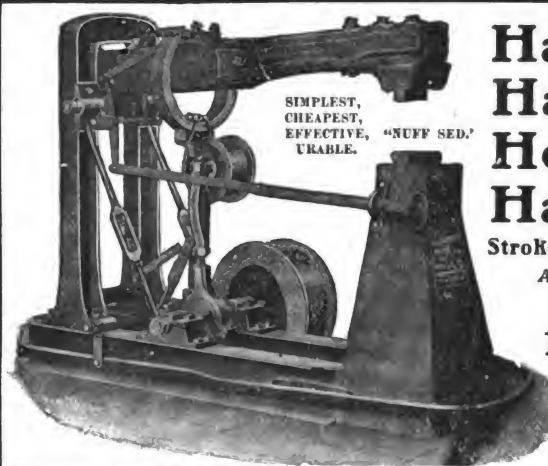


## BAUER GASOLINE ENGINES..

The Acme of Simplicity and Perfection.  
If you will examine and compare,  
piece by piece, you will say there is no  
other quite so good as the "Bauer."  
All sizes from 1½ to 20 H.P. Write at  
once for free catalogue containing long  
list of letters from satisfied users. Our  
prices are also very interesting, con-  
sidering quality.  
THE FIRST BLACKSMITH in any town who  
buys of us gets the agency for his locality, a  
discount on his purchase, and a commission  
on his sales. A good engine sells readily.  
The Bauer is the best.

Write us Today.

**Bauer Machine Works Co.**  
115-120 W. 18th St., KANSAS CITY, MO.

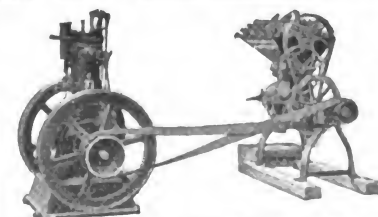


## Hathorn's Hard-hitting Helve Hammer.

Stroke adjustable while running.

Ask your dealer or write to

**HATHORN  
FOUNDRY &  
MACHINE CO.**  
GRINNELL,  
IOWA.



For Grinding, Pumping, Churning, and  
General Farm or Machine Shop Work, the  
Fairbanks-  
Morse **Gasoline Engine**  
holds the lead. It will do more work than any other  
Gasoline Engine of same horse power

Awarded Gold Medals at World's Fair, 1904

Cut out complete advertisement and send to  
**FAIRBANKS, MORSE & CO., Monroe St., Chicago, Ill.**

Please send me illustrated Catalogue No. L 487 Gasoline Engines. I may want..... H. P.  
Engine to run .....  
Name..... Street No.....  
Town..... State.....



8 YEARS  
WEAR AND  
TEAR

# Metallic Dashes

PROVE  
THEIR  
EXCELLENCE

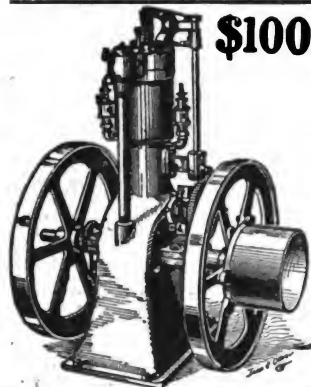


HIGH IN QUALITY  
LOW IN PRICE  
FINISH EQUAL TO BEST PATENT  
LEATHER, BUT MORE DURABLE

For Sale by your Jobber. If not,  
write us.

Send for Catalogue.

**BENNETT MFG. CO., Hunt, N. Y. BOX 506.**



## \$100 The New Pierce Gasoline Motor IS A WONDER.

It will develop more power on less fuel  
than any other make in the world ....

Built on modern lines and up to the very latest practice; made from the best material, and with ordinary care will last a life time.

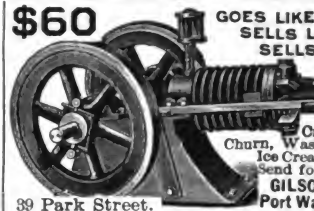
We have been building Gasoline Motors for over twenty years. More than 12,000 PIERCE MOTORS are in use in all parts of the world. We know how to, and do, build them right, in fact, we

**Guarantee Them to Give Satisfaction.  
If they do not, send them back and we  
will refund your money in full. . . .**

The PIERCE MOTORS are the best in the world and cost less than the poorest. We guarantee them against defective material for life. If you want power for any purpose, write for our printed matter, stating your needs. We also build other sizes up to 100 H. P., also Marine Motors, Launches and Auto Boats. Be sure and address

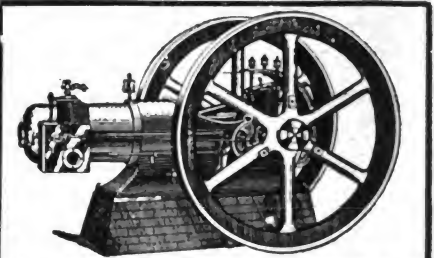
**PIERCE ENGINE COMPANY, - Dept. 12, Racine, Wis.**  
3 1-2 Actual Horse Power.

\$60



GOES LIKE SIXTY  
SELLS LIKE SIXTY  
SELLS FOR SIXTY  
**GASOLINE  
ENGINES**  
for Pumping,  
Cream Separator,  
Churn, Washing Machine,  
Ice Cream Freezer, etc.  
Send for catalogue.  
**GILSON MFG. CO.**  
Port Washington, Wis.

39 Park Street.



Why buy an experimental gas engine, when for the same money you can buy one that has stood the test for twelve years, and have the further advantage of being able to use it either with gasoline or kerosene. Built in sizes of from a to 100 H.P. Write for our large catalogue and prices. If interested.

**MODEL GAS ENGINE WORKS**

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New York Office, B-21 Produce Exchange.

## THE "BUSH" Low-down Handy Wagon

WITH 4-IN. TIRE STEEL WHEELS

Our wagons are well ironed throughout—wheels made with sound staggered spokes.



We make any size wheels to fit any skein.

We manufacture a complete line of metal wheels for corn planters, cultivators, plows, etc.

WRITE TO **C. BUSH, QUINCY, ILL.**  
(MENTION THIS PAPER.)

## THE SINNING GAS ENGINE

Is the simplest, most durable,  
and most reliable on the market

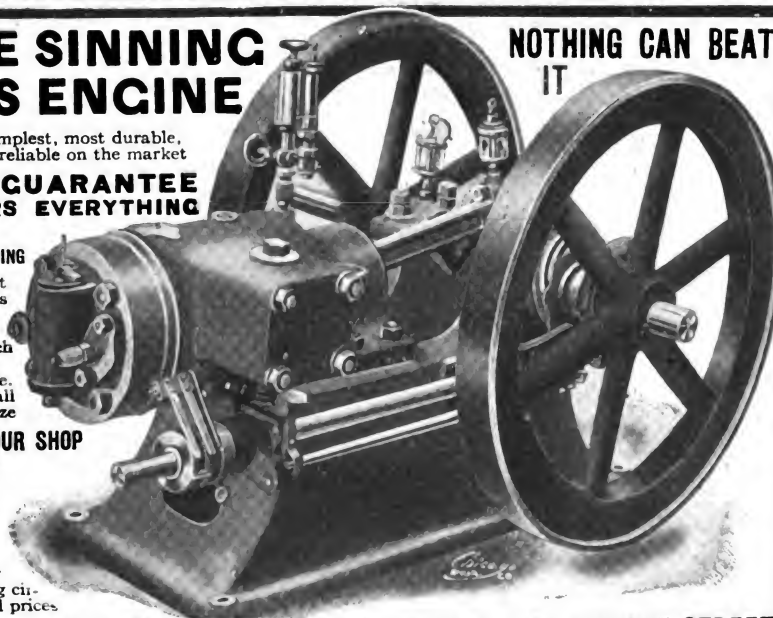
**OUR GUARANTEE  
COVERS EVERYTHING**

### THE SINNING

is cheapest  
to run, has  
few working  
parts,  
all of which  
are inter-  
changeable.  
Bearings all  
hard bronze

**EQUIP YOUR SHOP  
with the  
VERY  
BEST**

Write for  
interesting cir-  
culars and prices.

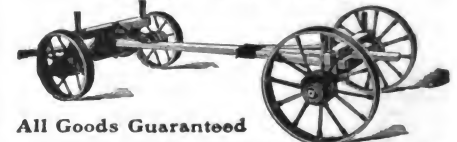


NOTHING CAN BEAT  
IT

**THE CHARLES SINNING MACHINE WORKS 242 DICKSON STREET  
ST. LOUIS, MO.**

## THE GENEVA Handy Farm Wagon

THE BEST METAL WHEEL WAGON MADE.



**All Goods Guaranteed**

Pressed steel wheels, any height and width tire, interchangeable hubs. Gears of selected stock, thoroughly ironed. Made in several styles.

WE ARE ESTABLISHING ONE AGENT IN EVERY TOWN.

Send for Descriptive Circulars to

**Geneva Metal Wheel Co.**  
GENEVA, OHIO

## ONLY ONE TO A CUSTOMER

AT THIS SPECIAL LOW SAMPLE ORDER PRICE



**\$50.00** buys a RUBBER TIRED BUGGY. Fine  
Leather Top. Tires Warranted.

RUBBER TIRED RUNABOUT for only **\$40.00**  
Quality, Material and Workmanship Fully  
Guaranteed. At These Special Prices f.o.b. Cars, Cincinnati.



REFERENCES:—Bradstreet's or Dunn's Mercantile Agency. All inquiries promptly answered. Write for catalogue and information.

**The Hickory Carriage Company**

(INCORPORATED)

MAKERS OF STANDARD GOODS

**SOUTH STREET**

**CINCINNATI, OHIO**





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Is what you are after. You want to know how to work steel at your forge. You desire the practical knowledge that will enable you to judge, forge, temper, weld, anneal and harden this most particular of metals. You want **Sound, Solid, Steel** talk, and you get it in

## The Scientific Steel Worker

By O. A. WESTOVER

A book written by a blacksmith and expert steel worker, and containing new methods of working steel, directions for manipulating the new steels; how to forge, harden and temper all kinds of tools; instructions for case hardening, annealing, welding and brazing. It contains recipes for welding and hardening compounds, twenty-four pages of mechanical tables for calculating iron, steel and angle iron, and many miscellaneous pointers contained in no other work.

The book is not written in "flowery" language, but is "meat" from cover to cover, and is easily understood. Exceptionally well bound in blue and red, and sent post-paid upon receipt of \$1.50. Address all orders to

**The American Blacksmith Co.**

P. O. Box 974. BUFFALO, N. Y.

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## Mr. Blacksmith

Would you be interested in learning how to pick up a good many extra dollars in your business with very little extra work? Would you like to increase your business—make it bigger—make more money and make more satisfied customers? You can do it and do it easily with

## O. K. Hoof Remedy

Hundreds of blacksmiths are doing it today and so can you. We want you to sell and recommend O. K. Hoof Remedy to your trade, and this is how we suggest you do it: First, we want you to test it. We want you to KNOW from actual experience what it will do so that you will have confidence in it—so that you will be enthusiastic over its merit. We will stand the risk if it does not do what we claim for it. For example, we offer \$100.00 for any case of Contracted Feet, Corns, Dry, Cracked, Brittle Hoofs, Scratches, Sores, Thrush and Quarter Cracks it fails to cure except in founder when used as directed. We do more—we say to you, and you can say to your customers, back goes your money if it fails. You take no risk. Send 15c for trial can and get our special liberal terms to blacksmiths. We want you to handle this remedy in your locality. You can sell lots of it and make money. Send today and "clinch" the agency.

THE O. K. STOCK FOOD CO.

Room 450 Monon Building  
CHICAGO

O.K. HOOF REMEDY  
KEEPS HOOFS O.K.

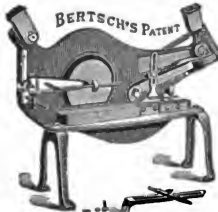


## Lathes and Drill Presses

Especially for Blacksmiths and Machinists, also Hand and Power Planers and Shapers and Machinists' Supplies.

Catalogue M.

SHEPARD LATHE CO., 132 W. 2d St., Cincinnati, O.

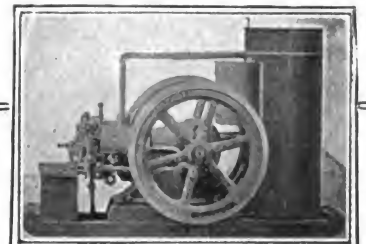


We Manufacture

## SHEARS AND PUNCHES

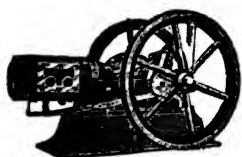
Hand or power, for shearing and punching plates, bars and angles. Send for Catalogue C.

BERTSCH & CO.  
Cambridge City, Ind.



## Our 4 H. P. Engine

Fills every shop requirement and is always ready for business. Giving perfect satisfaction to hundreds of shop owners. Simple, strong, substantial. Best material and finest workmanship. Write for our Catalogue. Sent free for the asking. ROCKFORD ENGINE WORKS, Rockford, Ill.



## The SIMPLEST Engine Built

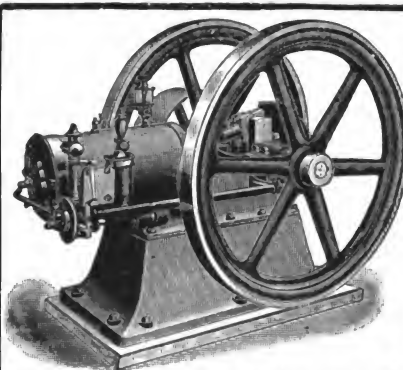
## The DAVIS Engine

Combines all Modern Improvements. The Safest, most Economical and most Reliable Power for the Shop Owner.

Davis Engines are in use every day in thirty-four states and territories in the United States, in six provinces in Canada and British America, and in many States in Old Mexico.

Drop us a postal card and we will send you free a beautiful illustrated catalogue with a full description of our Engine. Our prices will interest you. Write today.

**Cascaden-Vaughan Co.,**  
Waterloo, Iowa, U. S. A.



HIGHEST AWARD--GOLD MEDAL

ST. LOUIS EXPOSITION

FOR

Efficiency  
Durability  
Simplicity

Write for Catalogue and Prices,

BAY STATE GAS ENGINE CO.,

48 Washington St., North,

BOSTON, MASS.

## STARRETT TOOLS

THE  
STANDARD  
FOR

ACCURACY, DESIGN, WORKMANSHIP, FINISH,

L. S. Starrett says:

"If you find any better tools than Starrett Tools—buy them."

## HACK SAWS



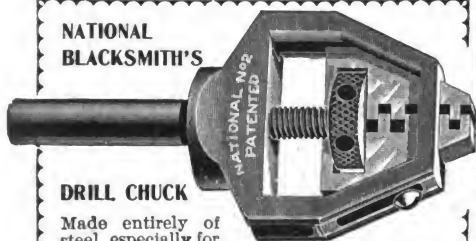
STARRETT QUALITY.

Complete Catalogue No. 17 A.H. sent on request. You ought to have it.

**THE L. S. STARRETT CO.,**

ATHOL, MASS., U. S. A.

NATIONAL  
BLACKSMITH'S



### DRILL CHUCK

Made entirely of steel, especially for blacksmithing and carriage work. Positive, strong and self-cleaning. Casts no shadows. Will save cost over other chucks in the saving of time. Money refunded if not as represented. Ask your jobber for it or send direct for prices and circulars. The best is the cheapest.

THE ONEIDA NATIONAL CHUCK CO.,  
Oneida, N. Y., U. S. A.

## "CHICAGO" EMERY WHEELS CUT QUICK

A wheel that will do the work in one-fourth to one-half less time is by far the cheapest in the long run. A wheel that will save only one hour per day during your busy season would pay for itself in full.



## "CHICAGO" WHEELS SAVE TIME

They're made  
of stuff that cuts

Emery Wheels, Glue, Emery, Polishing Wheels, Grinding Machinery  
136 Page Catalogue for the Asking

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CHICAGO, U. S. A.

## S. N. BROWN & CO. DAYTON, O. — MANUFACTURERS OF — Vehicle and Automobile Bows



### RUBBER STAMPS STEEL STAMPS AND STENCILS

SEND FOR CATALOGUE.

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338-340  
WASHINGTON STREET  
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**TRIMMINGS FOR EVERYTHING ON WHEELS**

Wholesale Manufacturers Write For Catalogue and Prices.

Export Work our Specialty. **TOPS FROM \$1.40 UP**

INDIANA TOP & VEHICLE CO.,  
Lawrenceburg, Indiana, U. S. A.

### ONLY 60 CENTS



Did you ever try to shoe a horse that would not stand still? By the use of my great **Pulley Breaking Bridle** you can make the most restless horse stand as quiet as a lamb—even ugly horses, stallions, etc., completely subdued while being shod. Price, **Only 60c postpaid.** You should own one. Will bring business to you. Send for circular telling all about it.

PROF. J. W. BEERY, PLEASANT HILL, OHIO.

### WESTFAHL (MILWAUKEE) RASPS

Can't be excelled for durability. "Hand Punched."



Our new 18 inch rasp. Round ends. Ask your dealer for the Westfahl brand. If he can't supply you write us your requirements. Mention The American Blacksmith, WESTFAHL & CO., Milwaukee, Wis.

PAT'D APRIL 29th, 1902.

### THE REYNOLDS AXLE GAUGE

Simple, accurate and durable. Your equipment not complete without one. Give this Gauge close examination. Best material and workmanship guaranteed. Beam is the very best tubing; one inch in diameter, six feet long. Pivot arm, gauge plate and indicator all of solid brass. Self adjustable to any length or size of axle.

**This Superior gauge is sold by dealers everywhere and always gives perfect satisfaction.**

**If your dealer cannot supply you write to us for our liberal thirty day free trial offer.**

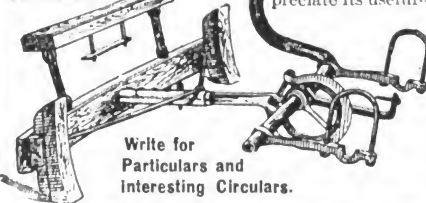
The exact amount of set or gather of the axle is registered automatically in Inch measure. You should have one of them in your shop. Write today for interesting descriptive circulars, sent free upon request. Drop us a postal for them.

**E. T. BUHL MFG. CO., CLEVELAND, OHIO, DEPARTMENT A.**

## KELLER ECCENTRIC BRAKE

Warranted to lock wheels with three ton load with ease; can be applied to any wagon. Works without aid of ratchet. Made in two sizes.

Note its construction, sturdy and serviceable.



Write for Particulars and Interesting Circulars.

Blacksmiths, wagon and buggy repairers especially, will see at a glance the merits of this axle cutter and appreciate its usefulness.

It will cut a pipe, boiler tube or shaft, as little or as much as desired and do its work accurately, taking the merest shaving from the end or cut in two at any point, its bearings being all on one side of the knife. Attractive propositions offered to live agents.



Rod,  
Pipe and  
Axle  
Cutter

Write  
for  
details

**Keller Mfg. Co., SAUK CENTRE, MINNESOTA.**

## AIR CUSHION RUBBER HORSESHOE PADS



### See That Cushion?

It fills with air at each step. That's what breaks concussion. That's what prevents slipping. That's what keeps the foot healthy. That's what tires footless.

Twelve Different Styles



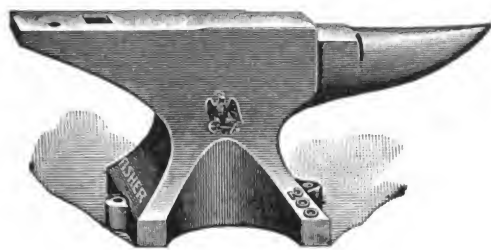
Heavy  
Leather Back

NO  
LAMENESS  
NO  
SLIPPING  
CHEAPEST  
AND  
BEST



Medium  
Canvas Back

**REVERE RUBBER CO.**  
Sole Manufacturers BOSTON, MASS.

**"EAGLE"****ANVILS.**

1843

1906

**We have had over sixty years of Experience in this line and offer you the most reliable Anvils on the Market. Every one Guaranteed.**

The Face Consists of a Single Piece of the Very Best Cast Steel Perfectly Welded and of the Hardest Temper. The Horn is made of Tough Untempered Steel and will neither Break nor Bend.

**All "Eagle" Anvils made with the Latest Fisher Patent Double Thick Steel on Both Edges of the Face. Made in all Shapes and Sizes up to 1300 lbs. Weight.**

WRITE FOR INTERESTING CIRCULARS AND PRICE LIST. SENT FREE.

**EAGLE ANVIL WORKS, TRENTON, NEW JERSEY.**

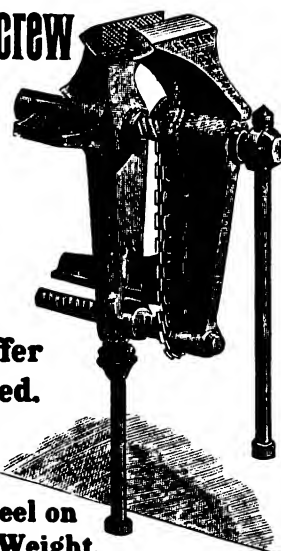
**PIONEERS**

In the Manufacture of

**ANVILS AND VISES OF QUALITY**

**"Fisher" Double Screw  
Parallel Leg Vise**

Is sold by Reliable Dealers Everywhere. For Strength and Durability there are none better made. The "FISHER" is acknowledged the best for Blacksmiths

**SEARS IMPROVED PUNCH AND SHEARS**

**W**E herewith present to the readers of THE AMERICAN BLACKSMITH our improved Punch and Shears, a machine that we guarantee to be the *most powerful* and *handy* of any punch and shear on earth for jobbing and wagon shops. This machine has no equal, as it has a power of 88 tons on punch with a man weighing 150 pounds on a 4-foot lever. It will punch a  $\frac{3}{8}$ -inch hole in  $\frac{1}{2}$ -inch iron, will shear iron  $\frac{3}{8}$  by 4 inches wide, and will cut off 1 inch round iron. The above work is done with ease.

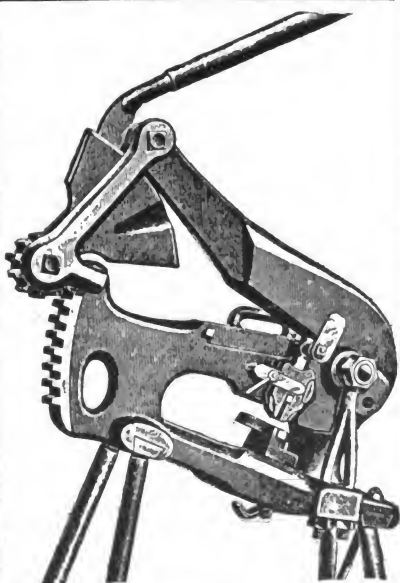
**OUR GUARANTEE**

We guarantee our Punch and Shears to do the work as stated above, and will give \$200.00 to anyone who will show a Punch and Shear that will compete with ours in a jobbing or wagon shop.

We are the only firm that advertises the length of lever it requires to do the work of these machines, and would suggest before buying a Punch and Shears to find out the length of lever it requires to do the work advertised.

SEND FOR CIRCULARS AND PRICE LIST

**GEO. SEARS & SON**  
ONSLow, IOWA



THE

**Little Giant**

COMBINED

**Punch and Shear.**

**The Most Powerful Lever  
Punch and Shear Made.**

5 Punches and Dies with  
Each Machine.

MADE IN THREE SIZES.

No. 1—Will punch  $\frac{3}{8}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{3}{8}$ -inch thick and 1-inch round. Weight, 515 lbs.

No. 2—Will punch  $\frac{1}{2}$ -inch hole in  $\frac{3}{4}$ -inch iron. Cuts iron  $\frac{1}{2}$ -inch thick and  $\frac{3}{4}$ -inch round. Weight, 850 lbs.

No. 3—Will punch  $\frac{3}{4}$ -inch hole in 1-inch iron. Cuts iron  $\frac{3}{4}$ -inch thick and 1-inch round. Weight, 220 lbs.

Only ONE operation of the Lever does the work. No changing required.

Note the improved Stripper and Hold-down. This machine is made for the blacksmith shop, and we DO claim that it is decidedly the best on the market for that place.

For Sale by your Jobber. If not, Write Us. Send for Circular.

**Little Giant Punch & Shear Co., Sparta, Ill.**





# DON'T BUY GASOLINE ENGINES

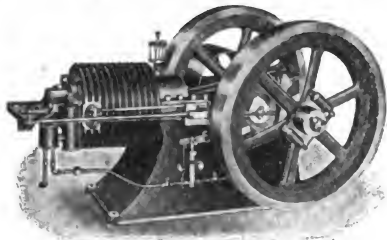
all one-cylinder engines; revolutionizing gas power. Costs Less to Buy and Less to Run. Quickly, easily started. No vibration. Can be mounted on any wagon at small cost—portable, stationary or traction. Mention this paper, SEND FOR CATALOGUE. THE TEMPLE PUMP CO., Mfrs., Meagher & 16th Sts., Chicago. THIS IS OUR FIFTY-SECOND YEAR.

UNTIL YOU INVESTIGATE  
"THE MASTER WORKMAN."

a two-cylinder gasoline engine superior to any wagon at small cost—portable, stationary or traction.

**PATENTS that PROTECT**  
Our 3 books for Inventors mailed on receipt of 6 cts. stamps  
R. S. & A. B. LACEY, Washington, D.C. Estab. 1888.

## The GADE Air Cooled Gasoline Engines



Made in 2, 3 and 6 horse power sizes. What's the use of paying good money for an old style engine, when you can get something better in the "Gade Air Cooled" at the same cost. Buy one. It will not freeze up or go back on you in cold weather. It's ready for business all the time. We know it will please. By all means write for descriptive circulars and price list of the "Gade." Address. **GADE MFG. CO., Iowa Falls, Iowa.**

**Remington Typewriters**

look durable  
and are as  
durable as  
they look.

**Remington Typewriter Co.**  
327 Broadway,  
New York.

**PATENTS** Promptly Secured.  
Highest references from  
prominent Manufacturers  
Write for Inventors' Hand Book.  
SHEPHERD & PARKER, 850 F St., Washington D. C.

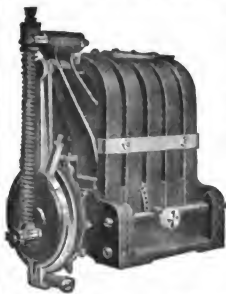
## ECLIPSE GAS AND GASOLINE ENGINES.

Vertical 2, 3, 4, 5, H. P.  
Horizontal 5, 10, 12, 15, 20, 25, H. P.

Designed and Built for BUSINESS.  
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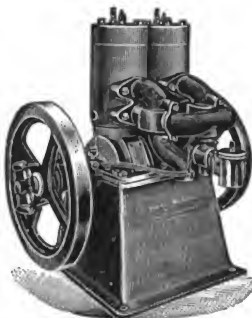


The Goodson Igniter is guaranteed to produce a sufficient spark to start a gas or gasoline engine without batteries or spark coil.

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Two cycle, a power impulse every revolution, we use no gears, cams, cam shafts, valves or valve springs, no engine can be simpler or more durable. If you want a well built engine, one built of the best materials, then just send us a postal for our catalogue and price list.

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GAS AND OIL, 1½ to 70 H. P.  
Safe, Reliable, Economical.  
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A well-made, accurate machine; especially adapted to run by gasoline engine; capable of all kinds of band-sawing, particularly carriage repair work. These are a few of the fine points of Marston's Band Saw.

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Armature incased in WATER-PROOF non-corroding brass tube. All brass screws. Friction, Belt or Governor drive. Brush-holders removed without loosening screws. All parts polished brass. Contact and Jump Spark.

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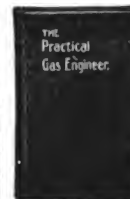
Most popular and satisfactory Magneto on the market. Price as popular as Machine.

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Are so rough looking that a good mechanic hates to use them. The "Milton" brand are not that kind. They are made as good as it is possible to make a Hot Pressed Nut. They have the tensile strength of the best of iron and they are manufactured by a process that finishes them in good shape for honest service. Some of our buyers think they are good enough for any kind of work. We would like to have you try them when in need of anything in this line.



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We also make Cold Punched Nuts, Washers, Refined Bar Iron, etc.

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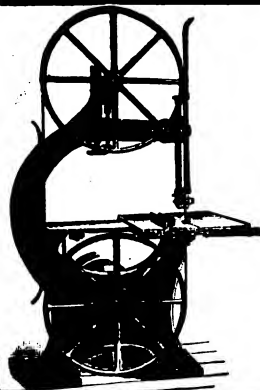
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Gas engine ignition is made sure by the **APPLE AUTOMATIC SPARKER.** It "gets" all possible power out of every explosion because its sparks give off heat and explode an entire charge at an instant. No switches, no belts, no batteries.

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## You Need Wood Working Machinery.

Wood Working Machines in your Shop will enable you to do better work and more of it than you can do with hand tools.

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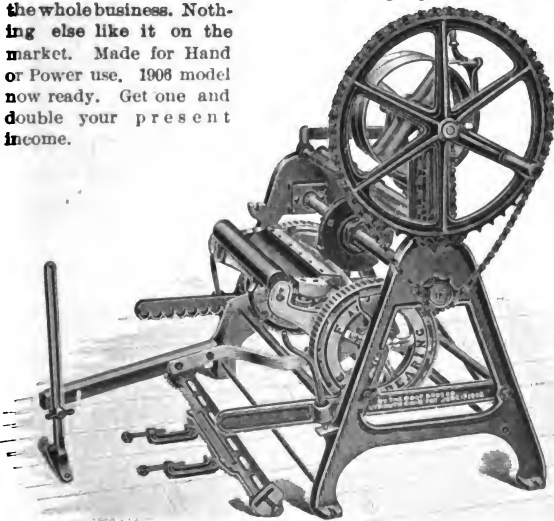
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is as good as a personal call and costs only 3c including 2c. for postage. Samples and particulars Free.

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13½ E. Swan St., BUFFALO, N. Y.

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Will enable you to grind any lawn mower with absolute accuracy in less than fifteen minutes, without taking apart. Revolutionizes the whole business. Nothing else like it on the market. Made for Hand or Power use. 1906 model now ready. Get one and double your present income.



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Manufacturers of

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**BORAX-ETTE** makes steel weld easily. It does not have to be applied between the laps like other compounds, but is used the same as borax. It has no equal for all kinds of steel welding.

**SAMPLES FREE.**

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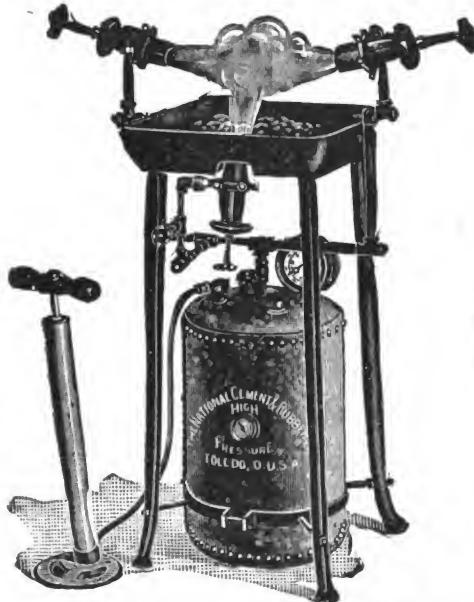
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STANDS FOR  
QUALITY  
SIMPLICITY  
DURABILITY  
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SATISFACTION



The Tritt  
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"High Pressure" Brand No. 2 Brazing Forge



Patented February 7, 1900. The up-to-date machine for brazing agricultural implements, automobiles, bicycles, etc. Will do all kinds of brazing, both light and heavy. It is fitted with three powerful improved Hydro Carbon Burners. Both Gasoline and Kerosene Machines in stock. Write for description.

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## "The Australasian Coachbuilder & Wheelwright."

A Monthly Illustrated Technical Journal circulating amongst Coachbuilders, Wheelwrights and Blacksmiths throughout the Commonwealth of Australia, New Zealand and South Africa.

Advertising and subscription rates on application to

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## New Era Electric BLOWER

Direct connected, has been designed especially for the blacksmith, and it is his ever-ready helper that works for less than five cents a day, and never tires. It places him on an equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.

NEW ERA ELECTRIC CO.



Write for circular and particulars.

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Combined Punch and Shear.



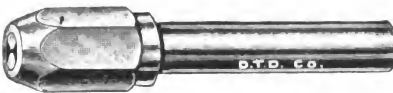
Double lever system makes heavy work easy. Cuts and punches iron flat, round and angle. It will pay you to investigate our machine. Write for full particulars, price.

BLUM BROS. COMPANY,  
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That will fit the spindle of your drill press, holding drills  $\frac{1}{2}$  to  $\frac{3}{4}$  in. inclusive, with reducer to  $\frac{1}{4}$  in. Drills held by this chuck are much cheaper than drills with  $\frac{1}{2}$  in. or  $\frac{3}{4}$  in. shank. Simplest and cheapest chuck on the market.

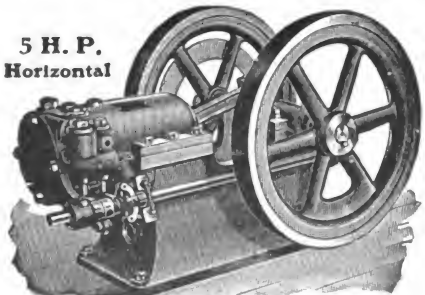
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228 21st Street, Detroit, Mich.

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Horizontal



Sizes, 1 1/2, 3, 4 1/2 H. P. Vertical.  
5 to 25 H. P. Horizontal.  
Either tube igniter or electric igniter. Shipped mounted on skids, if desired for farm use.

Also equipped with pumping attachments. Write for booklet describing full line New Era Gas Engines from 5 to 100 H. P. Special inducements to dealers as agents.

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No. 63 Dale Ave., DAYTON, OHIO.



3 H. P.  
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THE NEW ERA IRON WORKS CO.

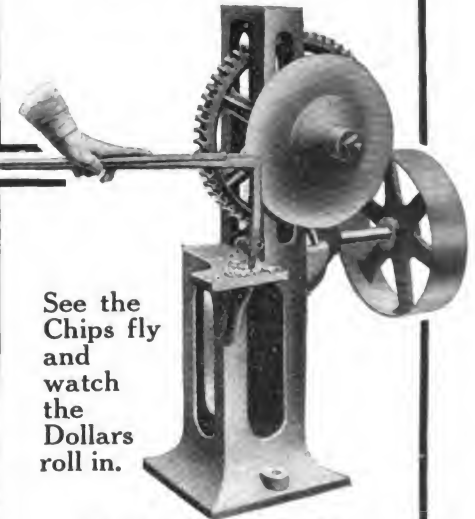
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## MONARCH DISC SHARPENER

GETS THE BUSINESS.

Don't let your  
Neighbor  
Do it First



See the  
Chips fly  
and  
watch  
the  
Dollars  
roll in.

ORDER NOW  
and Cinch the Trade  
in your Section.

The Wonderful Work that  
this Machine does can hardly  
be believed—but seeing  
is believing. . . . .

REMEMBER it was designed by  
a practical smith and is made by  
the oldest and largest Iron Works in  
the West.

INTERESTING CIRCULARS SENT FREE.  
WRITE TO

The MURRAY  
Iron Works Co.  
BURLINGTON, IOWA.



FULLY  
PROTECTED  
BY PATENTS.

## BUFFALO No. 666 Portable Down Draft Forge

A MOST INGENUOUS APPLICATION OF THE BUFFALO DOWN  
DRAFT SYSTEM.

ALL SMOKE, GASES, FUMES AND CINDERS  
ABSOLUTELY DONE AWAY WITH.

The hottest flames and stifling heat  
can no longer cause the smith such dis-  
comfort as he has hitherto been com-  
pelled to submit to.

### HOW THEY WORK

On turning the crank of the powerful No. 200 Blower  
attached to this forge, all smoke and gases from the fire  
are drawn into the stack by means of the draft produced  
by a connection to fan case. The larger part escapes up  
the stack by reason of the natural and induced draft  
while a portion passes through the fan into tuyere. A  
separate connection from blast pipe into stack strengthens  
the natural draft and is of great service when fire is  
being started.

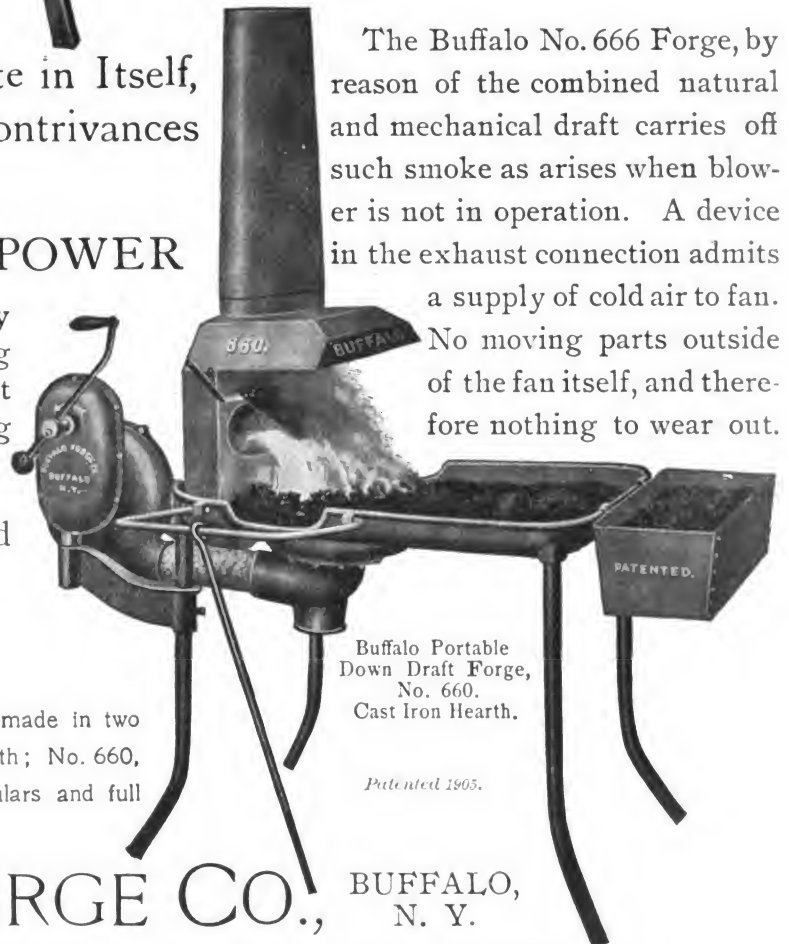
Every Forge is Complete in Itself,  
and Needs no Exterior Contrivances  
Whatever.

### NO ADDITIONAL POWER

No additional power is necessary  
to operate blower. In place of taking  
air at the fan case, blower takes it  
from over the fire, producing a strong  
draft without extra effort.

Put in a Buffalo No. 666 and  
keep the Smithy Clean,  
Cool and Light.

Buffalo Portable Down Draft Forges are made in two  
styles: No. 666 made with Steel Plate Hearth; No. 660,  
made with Cast Iron Hearth. Send for circulars and full  
particulars.



Buffalo Portable  
Down Draft Forge,  
No. 660.  
Cast Iron Hearth.

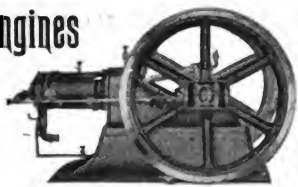
Patented 1905.

**BUFFALO FORGE CO.,** BUFFALO,  
N. Y.

THE CANADIAN BUFFALO FORGE CO., Ltd. MONTREAL.

**Simplicity Engines**

All Sizes  
Get our proposition.  
Western Malleable  
and Grey Iron  
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**SALEM, OHIO.**

**HAND and POWER DRILLS**  
Hub Boxing Machines, Tuyere Irons etc.  
Catalog Free.

**IT DOES THE TRICK! R. F. D. SPECIAL**

This axle runs easier than any other, and requires no attention.  
"It's a Wonder." STANDARD BALL AXLE WORKS, Lancaster, Pa.

**THE "ELI" LEADS 'EM ALL****THE "FOOL-PROOF" GASOLENE ENGINE**

The "ELI" Gasolene Farm Engine is the only fit engine to have on a farm, where one is a good way from the repair shop. The "ELI" is so simple that there's nothing to get out of order. It will run year in and year out without the tinkering that other engines require. It is the only engine without cams, gears, and levers. We call it "Fool-Proof" because, if some simpleton or a child should monkey with it, he couldn't make it dangerous. It is absolutely safe. Isn't that the kind of an engine YOU want? Then write for our free booklet, telling how and why it is so simple and safe.

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**MOLINE, ILL.**

**BUILD YOUR OWN GASOLENE MOTOR**

We supply the castings, drawings and all accessories. A complete line of rough castings, also finished Motors for Bicycle, Automobile, Marine or Stationary. A 2-cent stamp gets our catalogue.

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2941 Girard Ave., Philadelphia, Pa.

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Buy the  
**GENUINE  
POPE'S**

Patented Sept. 12th 1899.

Do not  
**ACCEPT A  
SUBSTITUTE**

The handles of the GENUINE POPE'S KNIVES are now made with the notched end shown above. All such bear the maker's name, T. J. POPE. All genuine Blades are stamped PAT. SEPT. 12, 1899.

For Sale by dealers in Blacksmiths' Supplies Everywhere, SOLE AGENTS,

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San Francisco Office, 105 Front St., Hughson & Merton.

**NOVELTY IRON WORKS BOSS HAMMER**

For Plow Work, Wagon Work, Heavy Work, Any Work.

I purchased a Boss hammer from you over one year ago and it has been put through the severest test on all kinds of work such as stone-cutters and ice tools, shipsmithing and machine forgings. Am making connecting rods with 2 1/2-inch stem under same and can weld 2 inch axles on same.

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Sandusky, Ohio.

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**LIGHTNING PORTABLE PUNCH NO 5**

**PATENT LIGHTNING PORTABLE HAND PUNCH.**  
Several sizes. Capacity up to 1/4 inch plate. Indispensable in any shop.

MFG. BY AMERICAN LOCK NUT COMPANY OREGON, ILL.

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**ECONOMICAL and RELIABLE POWER FOR THE SHOP-RUNNING BLACKSMITH and WAGON MAKER.**

HAGEN ENGINES are recommended on account of their simplicity, durability, comparatively low price, small cost of operating and the ease and certainty with which they can be controlled.

Our Catalogue explains all working parts. A postal will bring a copy to you. It's free. Write today.

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**A RELIABLE HELPER. FODEN'S MECHANICAL TABLES**

**SAVE ALL FIGURING!**

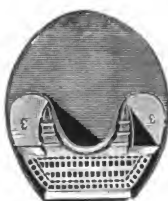
Tell at a glance how much stock to use for oval or elliptical hoops of any size, the circumferences of circles, weight of flat, square and round stock, and the weight and strength of ropes and chains.

Should be in every progressive Smith's hands. Bound very neatly in green cloth. Price, 50c. **AMERICAN BLACKSMITH COMPANY, Buffalo, N. Y.**

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For Sale by All Jobbers.

**THE "GEM" IT WILL PAY YOU.**

**CONSOLIDATED  
HOOF PAD CO.**

18 Vesey St.

NEW YORK.

**THE MODERN FOOT-POWER HAMMER Takes the Place of a Helper**

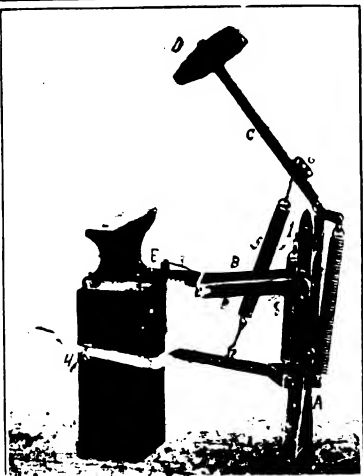
by the anvil, for sharpening plowshares, cultivator shovels, etc., and for nearly all kinds of general forging and welding, also for striking on tools, such as Chisels, Punches, Flatters, Swages, etc. Will strike just as light or heavy as desired by the operator, and is very easily operated. Cannot be fully appreciated until you have tried it.

Mr. A. S. Lockrem, Dear Sir: In regard to the "Modern Foot Power Hammer" which I bought of you, will say that it does all that you claim for it and more.

Yours truly, A. F. ALLIS, Wayne City, Ind.

Write for Circulars and Prices.

**AUG. S. LOCKREM.**  
Pierpont, S. D.





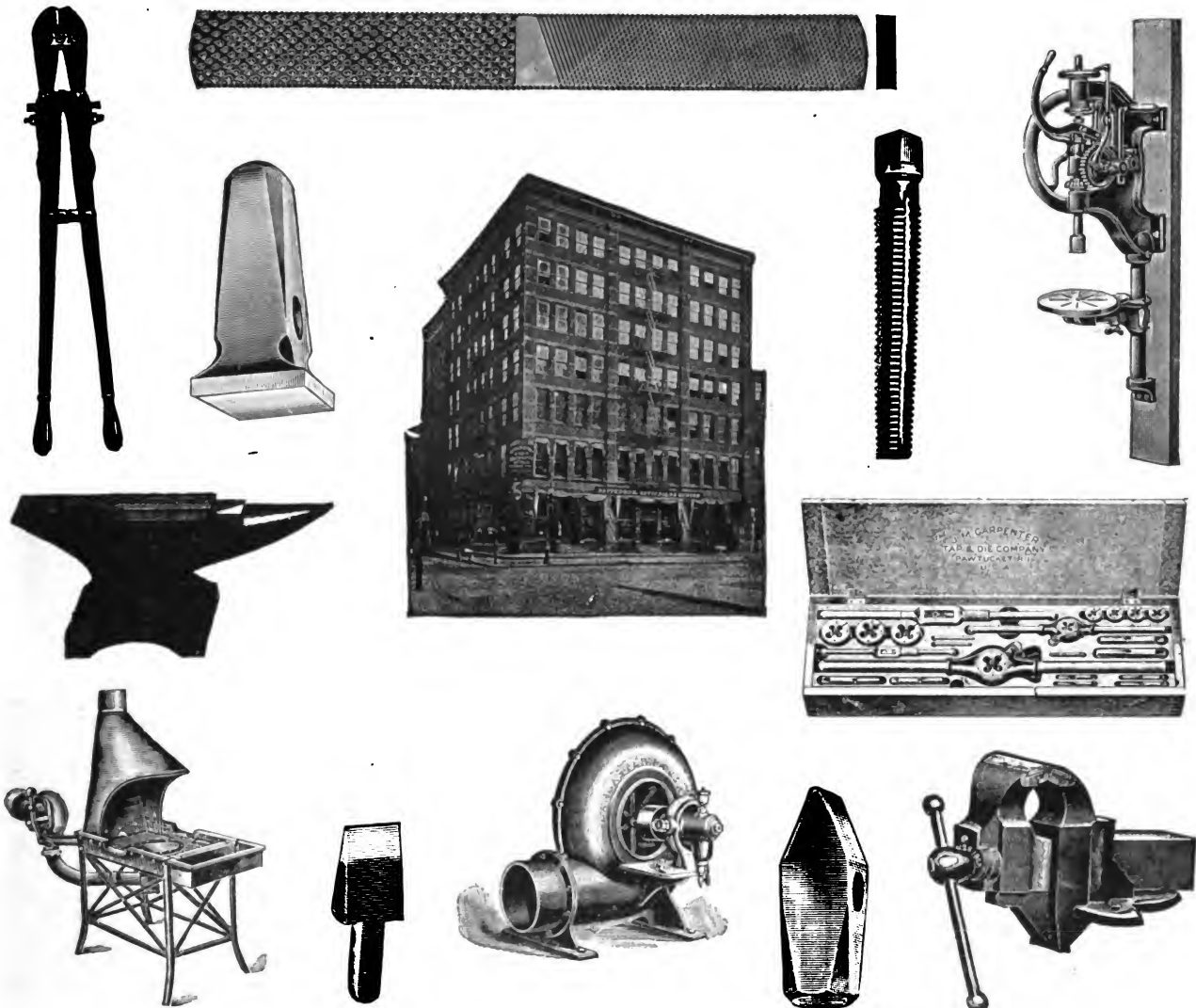
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BE SURE YOU BUY RIGHT.**

ESTABLISHED 1876.

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**YOU CAN DO IT IN AN EASY INEXPENSIVE MANNER.  
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We carry everything for the Blacksmith. A neat Catalogue illustrates and describes an extensive variety of Blacksmith goods. A letter or a postal will bring the book to you. Then select what you want and **WRITE FOR PRICE**. Prices change constantly. **THIS IS THE SAFEST COURSE.** We introduced the Ellis Wrench. A Wrench that will do the work of a set of wrenches and more.



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If interested, write for  
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## KERRIHARD'S POWER HAMMER,

Adapted to all shop uses. Does the  
WIDEST RANGE OF WORK.

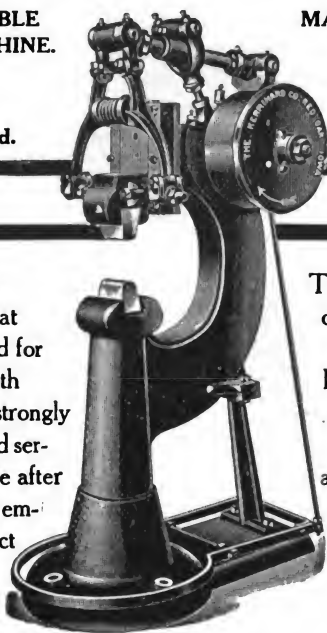
A RELIABLE  
MACHINE.

MADE BY A  
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Every one  
Guaranteed.

Satisfaction  
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This is the Hammer that was designed for the blacksmith shop and is strongly built for hard service. Made after correct lines, embodies correct mechanical principles.



To give the shop owner a durable and efficient hammer, we use only the very best material and employ only the most skilled workmen. It pays to buy the best.

Height over all	-	-	55 in.
To top of Anvil Block	-	-	31 in.
Floor Space	-	-	18 x 30 in.
Weight	-	-	700 lbs.

### YOUR EQUIPMENT IS NOT COMPLETE

If your shop does not contain a Kerrihard hammer. This is the most valuable addition you could make to your outfit. The Kerrihard hammer is built right, runs right and will do your work right.

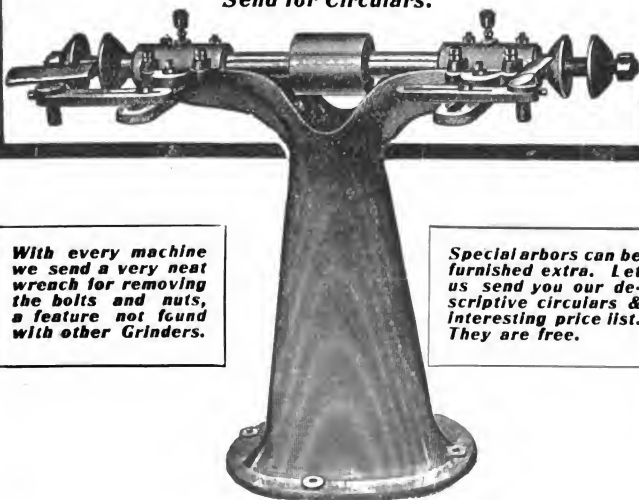
GET CIRCULARS and PRICES. SENT FREE.

**THE KERRIHARD CO.,**  
RED OAK, IOWA, U. S. A.

### OUR NEW EMERY GRINDER

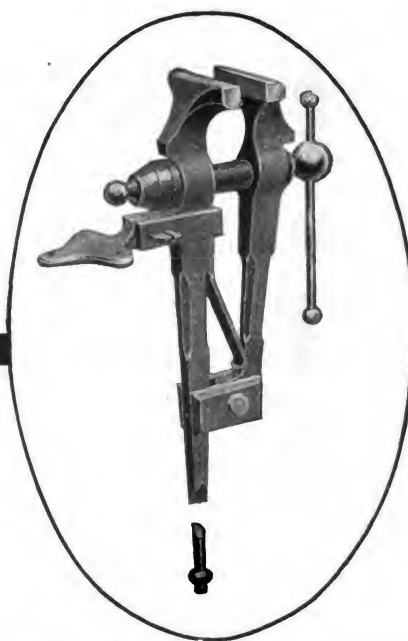
is Especially designed for the Blacksmith Trade. Will Carry Wheels 20 in. in diam., 3 in. thick or smaller with 1 1/4 hole. Price most Reasonable.

Send for Circulars.



With every machine we send a very neat wrench for removing the bolts and nuts, a feature not found with other Grinders.

Special arbors can be furnished extra. Let us send you our descriptive circulars & interesting price list. They are free.



## HANDY FOR HORSESHOERS

Save Time!!!!

Turn both calks of your horse-shoes with one heat.

Buy a Columbian Solid Box Horseshoers' Vice and you can.

The top of the front jaw is flat and at right angles to face of jaw.

And a 60 lb. Columbian Vice has jaws six inches wide, providing an ample working surface.

The Columbian is made of special steel. Jaws are faced with crucible steel.

A 60 lb. vise actually weighs from 60 to 63 lbs., never less than sixty.

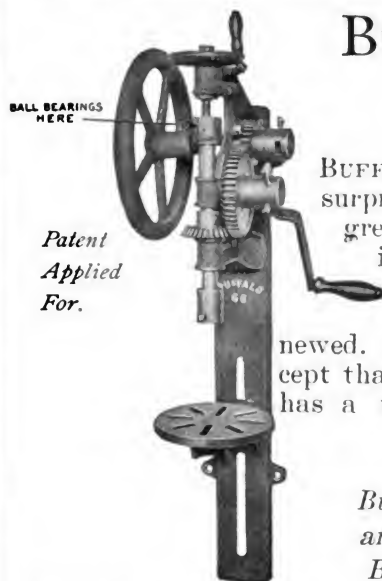
Every blacksmith who takes pride in his tools and who desires a a vise that will give long and satisfactory service needs a Columbian Vise in his shop.

See that our trade mark, "Columbian Cleveland, Original Trenton," is stencilled on the front jaw of that new vise you get, so as to be properly equipped for your Spring Trade.

Write for our Vise and Anvil Catalogue No. 16 and secure full information.

**THE COLUMBIAN HARDWARE CO.**  
MANUFACTURERS  
OF CLEVELAND, OHIO, U. S. A.

## Buffalo Ball Bearing Drills 1906 PATTERNS



*Patent  
Applied  
For.*

Buffalo No. 66 Ball  
Bearing Drill.

BUFFALO NOS. 66 and 68 are Ball Bearing Drills of surprising strength and capacity. They operate with greatest ease which is due to the splendid bearing construction. Wear is reduced to the greatest minimum possible. No brass connection nuts or soft metal bearings to be renewed. Both Drills are identical in construction except that No. 66 has an iron back and No. 68 has a wood back.

*Buffalo Nos.  
are designed  
Blacksmith*

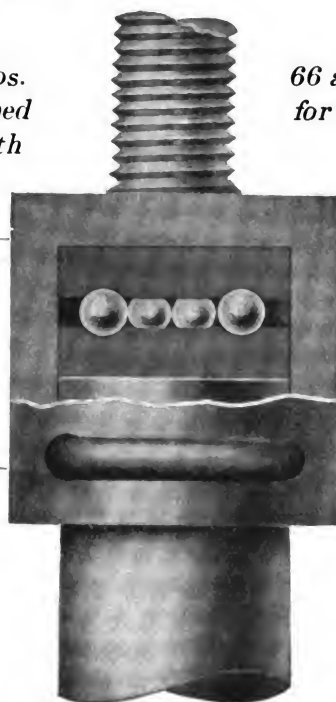
*66 and 68 Drills  
for light general  
Work.*



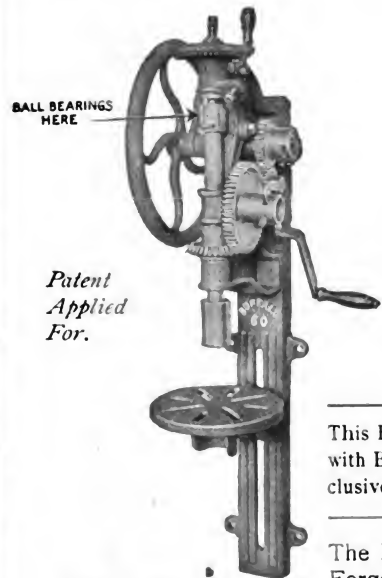
*Patent  
Applied  
For.*

Buffalo No. 68 Ball  
Bearing Drill.

This is an enlarged sectional view of Ball Bearing connection, with Ball Case, Disconnecting Key and Bearings. Used exclusively on Buffalo Nos. 60, 66 and 68 Drills.



The Ball Bearings are placed at the point of greatest friction, where the rapidly revolving Drill Spindle is connected to the Feed Screw, thereby reducing wear to the greatest minimum possible.



*Patent  
Applied  
For.*

Buffalo No. 60 Ball  
Bearing Drill.

### BUFFALO 90 DRILL LEVER FEED WITH THREE DISTINCT — FEATURES — ARRANGED FOR POWER CONNECTION.

This Ball Bearing Cut shows the enlarged end of Feed Screw with Ball Case, Disconnecting Key and Bearings. Used exclusively on Buffalo 90 Drill.

The Lever Feed on Buffalo 90 Drill is made of Heavy Forged Steel. It can be instantly placed in position or removed at will. This Lever Feed is separate from Drill and complete in itself.



*Patent  
Applied For.*

### BUFFALO 60 BALL BEARING DRILL.

This is a Hand Drill of enormous capacity. Designed for Heavy Blacksmithing. Well and Durably Constructed. Is equipped with the same excellent Ball Bearing Connection as Buffalo Nos. 66 and 68, but Drill is of considerably larger capacity than either of these.

Buffalo No. 90  
Ball Bearing Drill.

SEND FOR ILLUSTRATED CATALOGUE OF OUR EXTENSIVE LINE.  
**Buffalo Forge Co., Buffalo, N. Y., U. S. A.**

CANADIAN BUFFALO FORGE CO., LTD., MONTREAL.

*Little Giant.***A SIGN OF  
Strength and Quality****COMBINED  
Swage Block and Mandrel**

Upwards of seventy forms and shapes are contained in this swage block. The base is 15x15x18, mandrel 35 inches high, making total height 53 inches. Mandrel is flattened on one side to permit use of tongs to grasp work. Mandrel is used to turn swage block so as to bring the form which is desired to be used on top. It is easily handled and does away with the necessity of a base.

For blacksmiths, carriage makers and machine shops this will be found a desirable and convenient addition to their labor-saving tools.

We carry a Complete Line of Drills, Vises, Bolt Headers, Swage Blocks and Mandrels.

Complete Catalogue free

Write for a copy today

**B. B. NOYES & CO.**  
Greenfield, Mass., U. S. A.



For Gas or Gasoline  
— 0 —  
Sizes 2½ to 30 H. P.  
— 0 —

**Greendale Gas Engines.**

THE BEST POWER  
For Blacksmith Shops.  
Also adopted for Electric Lighting.

Write for Catalogue A. B.  
**GREENDALE GAS ENGINE CO.,**  
WORCESTER, MASS.

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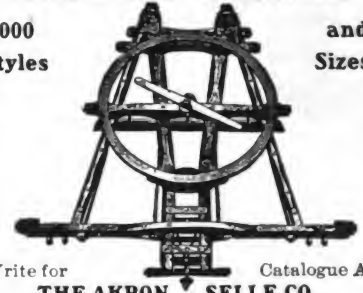
Send for Inventor's Primer. Consultation free. Established 1864.

**MILO B. STEVENS & CO.,**  
852-14th St., Washington, D. C.  
Branches at CHICAGO, CLEVELAND, DETROIT.

**WAGON GEARS**

1,000  
Styles

and  
Sizes



Write for Catalogue A  
**THE AKRON SELLER CO.,**  
Akron, Ohio.

**“THE VICTOR”**

ON ITS  
MERITS.

FIND THAT NAME ON THE BLADES.  
YOU BUY AND YOU WILL HAVE  
A SAW THAT WILL DO YOUR  
WORK PROPERLY, A  
SAW THAT YOU  
CAN RELY  
UPON.

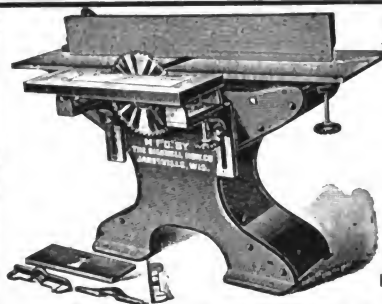
WE SEND  
SAMPLES TO YOUR  
ADDRESS FREE OF CHARGE  
TO YOU. WE WANT YOU TO TRY OUR  
SAWS AND INVESTIGATE THEIR REAL MERITS.

A POSTAL WILL BRING THE SAMPLES.

WRITE TODAY.

**MASSACHUSETTS SAW WORKS,**

FACTORY—CHICOPEE, MASS. NEW YORK STORE, 56 READE ST.



**BICKNELL'S  
COMBINATION  
JOINTER, SAW  
AND SPECIAL  
MACHINE**

Acknowledged the best.

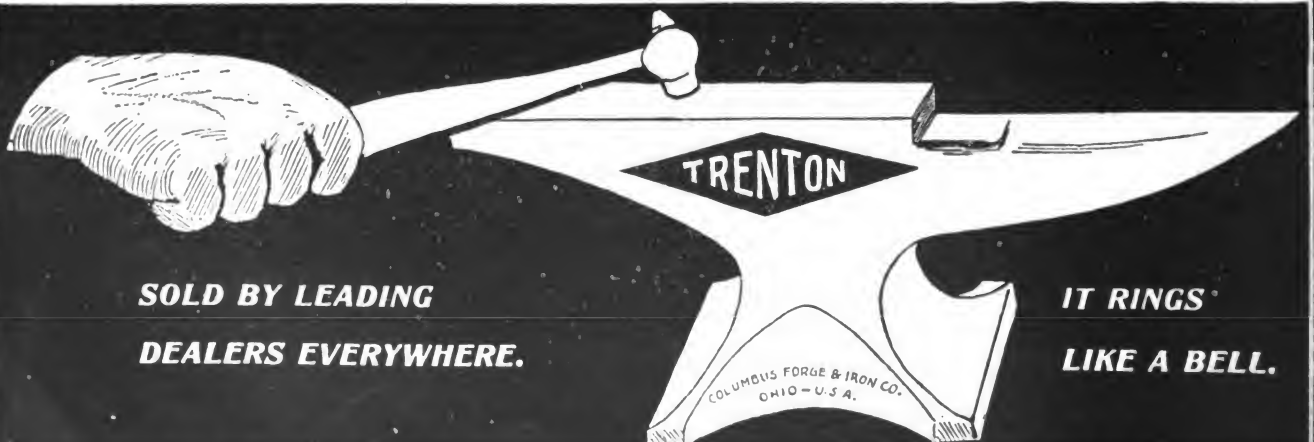
In use in Every State.

For Sale by your Jobber.

**THE BICKNELL MFG. & SUPPLY CO.,**

Manufacturers of  
Iron and Wood Working Machinery.

Janesville, Wis.



**SOLD BY LEADING  
DEALERS EVERYWHERE.**

**IT RINGS  
LIKE A BELL.**

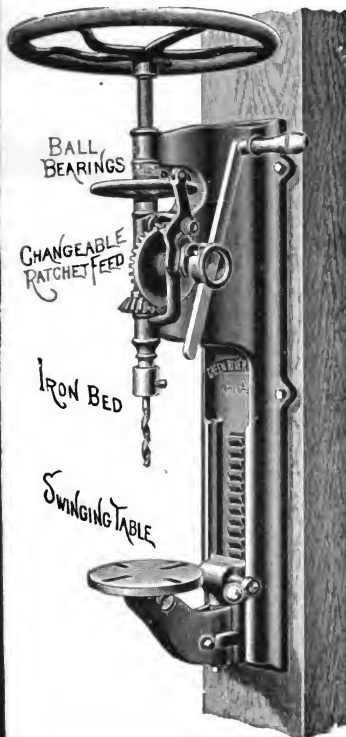


# GREEN RIVER DRILLS

AA (No. 734).

## LAST A LIFE-TIME

No. 744.



They cost but a little more than the cheap article.

The "GREEN RIVER" Drill is built for wear and long service.

Fully Guaranteed.

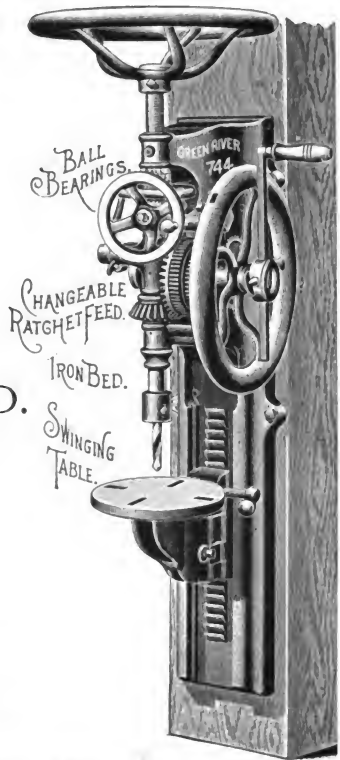
Write for New Catalogue No. 33 D. and see full description.

MADE BY

**WILEY & RUSSELL MFG. CO.,**

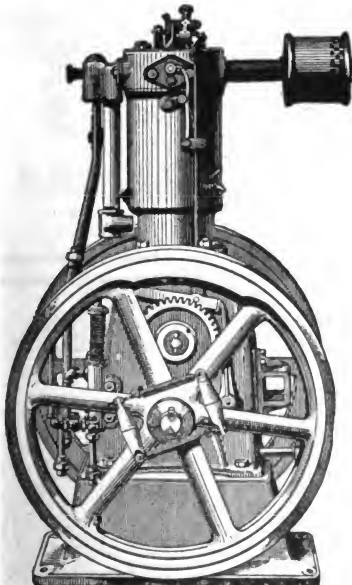
**Greenfield, Mass., U. S. A.**

Also Screw Plates, Taps, Dies, Bolt Cutters and Shoeing Vises.



## A WELL CHOSEN POWER

Saves a world of annoyance to the operator. A power is not well chosen that is not simple, reliable, ample for needs, easily kept in order, economical in operation, etc.



Then, it makes a difference what your work is. There are many styles and sizes of engines. See that the one you buy is adapted to the work in hand.

### The I. H. C. Gas And Gasoline Engine Line

meets all requirements. Neat appearing, easy running, take little fuel for power generated, so simple they cannot get out of order, so easily understood that anybody can operate them.

**An I. H. C. Engine always responds. Make sure of getting the dependable kind.**

You'll find the style and size that will exactly meet your wants. Horizontal, Stationary and Portable in 4, 6, 8, 10, 12 and 15 h.p. Vertical in 2, 3, 4 and 5 h.p. Write for CATALOGUE and investigate.

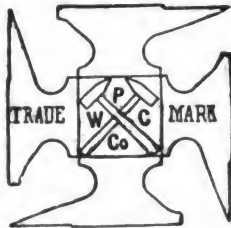
**THE INTERNATIONAL HARVESTER COMPANY OF AMERICA, (INCOR.)**

No. 7 U Monroe Street, CHICAGO, ILL., U. S. A.

**YOU WILL NEVER FAIL**

*To Make a Strong, Clean Weld If You  
Use Perfection Welding Compound.*

We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



Perfection Welding Compound will do the trick quickly and neatly. It makes a stronger weld than any other compound manufactured, as proven by the tests it has undergone. Send for free sample.

PRICE CONSISTENT WITH QUALITY.

**PERFECTION WELDING COMPOUND CO., SCRANTON, PA.**

**DOES IT PAY**

*TO STOCK UP WITH  
LOW PRICED TOOLS?*

**STERLING HACK SAW BLADES**

ARE NOT THE LOWEST IN PRICE BUT THEY ARE  
**THE CHEAPEST** FOR YOU FOR YOUR CUSTOMERS.

**BECAUSE**, MADE FROM THE HIGHEST GRADE OF STEEL THAT MONEY CAN BUY. MADE WIDE AND HEAVY.  
*There's a purpose in this. It costs us money.*  
COSTS YOU NO MORE THAN LIGHTER THINNER BLADES.  
**DIAMOND SAW & STAMPING WORKS,**  
BUFFALO, N.Y. U.S.A.

SAWYERS BAR, Cal., March 3, 1906.

Buffalo Forge Co.,  
Buffalo, N. Y.

Gentlemen:

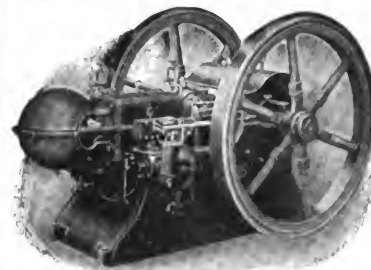
Eighteen years ago I bought a No. 3 Buffalo blower and a forge. The blower has not cost me one cent, only for oil, and it is as good now as it was 18 years ago when I bought it. There is not a man on the Pacific Coast that has a Bellows which will run fast enough for me. If I was going to work in a shop that had no Buffalo blower, for only three months, I would buy one at my own expense.

Yours very truly,

G. W. BIGELOW.

**LIGHTNING BALANCED**

**GAS and GASOLINE ENGINES**



**Are Especially  
Suited for  
Blacksmith Shop  
Power.**

Write for Free Catalogue.

**KANSAS CITY HAY PRESS CO.,**

482 Mill Street,

KANSAS CITY, MO.

INVESTIGATE THE

**Hercules Hydraulic**

**Before  
You  
Buy a  
Tire Setter**



**National Machine Co.**

KEOKUK, IA.

**Henderson Hand Power TIRE SETTERS**

Set Tires Cold.  
Keep the Dish right  
Tighten Wood Work  
Pull Broken Spokes  
Jump in New Spokes  
Are Money Makers



**Standard Tire Setter Co.**

KEOKUK, IA.

**HAY-BUDDEN SOLID WROUGHT ANVILS**

**The Gold Medal Anvil  
Highest Award**

OMAHA, 1898 PAN-AMERICAN, 1901

Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS.



**OVER 100,000 IN USE**

**WARRANTED**

Experience has proved their worth and demonstrated that "HAY-BUDDEN" Anvils are Superior in Quality, Form and Finish to any on the Market.

**HAY-BUDDEN MFG. CO., BROOKLYN, N. Y.**

# AMERICAN BLACKSMITH

BUFFALO  
N.Y. U.S.A.

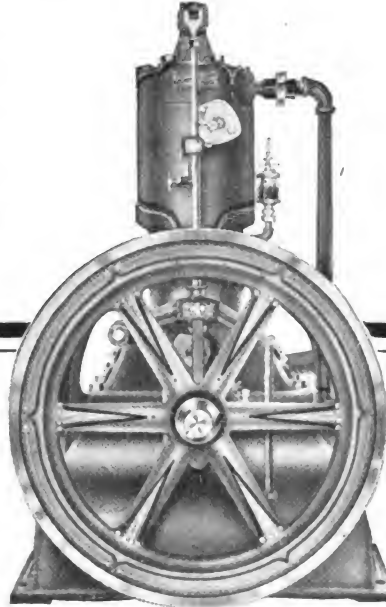
A Practical Journal of Blacksmithing and Wagonmaking

MAY, 1906

\$1.00 A YEAR  
10¢ A COPY

## The "SIMPLICITY" OF { DESIGN OPERATION CONSTRUCTION

This is the key to the success of our engines. When you buy an engine you want a machine that will run smoothly and requires no repairs at any time.



The "Simplicity" fills all shop requirements; demands little attention; never gets out of order; develops far more power than we claim for it.

*This is the  
Engine that*

*Will do your  
work properly*

## Don't Take Our Word For It

Let us send you one on trial and after giving it a severe test in your own shop you can return it at our expense if it does not fulfill every requirement. We make this offer to you because our engines never fail to give satisfaction. We make every part, employ only first-class workmen and use only the very best of materials.

### *Every Engine Fully Guaranteed.*

READ WHAT A FEW OF OUR CUSTOMERS HAVE TO SAY.

LODI, Wis., March 16.  
Western Malleable & Grey Iron Mfg. Co.,  
Milwaukee, Wis.  
Gentlemen—The engine that we purchased from you on Jan. 9, is the best and most simple engine that we have ever seen, and anybody that can take a grindstone apart and put it together again, can do the same with the "Simplicity." It is worthy of its name.  
Yours truly,  
H. A. ODELL.

WINDSOR, N. D., July 16.  
Western Malleable & Grey Iron Mfg. Co.,  
Milwaukee, Wis.  
Gentlemen—The engine I bought from you works to perfection. It is the best gasoline engine I ever used, and has lots of power. I would say to all that it is the engine to have no trouble with and no extra expense.  
Yours truly,  
R. C. BROWN.

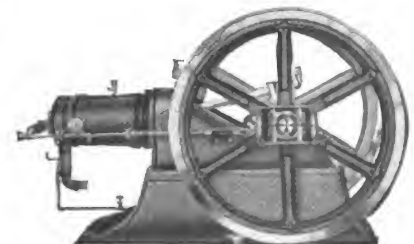
Write for a copy of our new catalogue, fully illustrated, and containing full description. It's free to you. Write us today.

**WESTERN MALLEABLE &  
GREY IRON MFG. CO.**

8-20 Chase St. MILWAUKEE, WIS.

WE MANUFACTURE  
ENGINES IN ALL  
SIZES FROM  
1½ to 15 H.P.

Also make Portables, Dumping  
Outfits and Sawing Rigs.



# CARRIAGE MAKER and BLACKSMITH TOOLS

## THE "ELITE" BLOWER

is correctly manufactured  
and is designed to  
meet the demands of  
hard service, together  
with the greatest  
possible efficiency,  
durability  
and convenience.

IT'S A  
MONEY  
MAKER.



Fig. 900, 12 inch.

Manufactured by

THE  
SILVER MFG. CO.

365 BROADWAY  
SALEM, OHIO  
U. S. A.

Hub Boxing Machines, Spoke Tenon Machines, Band Saws, sizes 20, 26, 32 and 36 inch, Forges, and a complete line of hand and light Power Drills, a 19-inch Post Drill and a 20-inch Round or Square Base Drill with Lever or Screw Feed. The last two drills are used extensively by Carriage Builders and others.

THESE ARTICLES  
ARE  
GUARANTEED  
AS  
REPRESENTED.

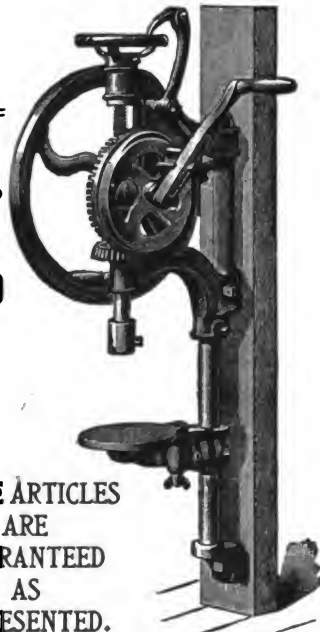


Fig. 731, No. 1.

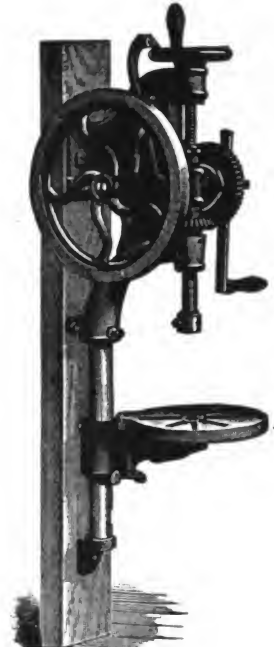


Fig. 742, No. 12.

Special prices are extended to Carriage Makers and Smiths  
if this paper is mentioned.

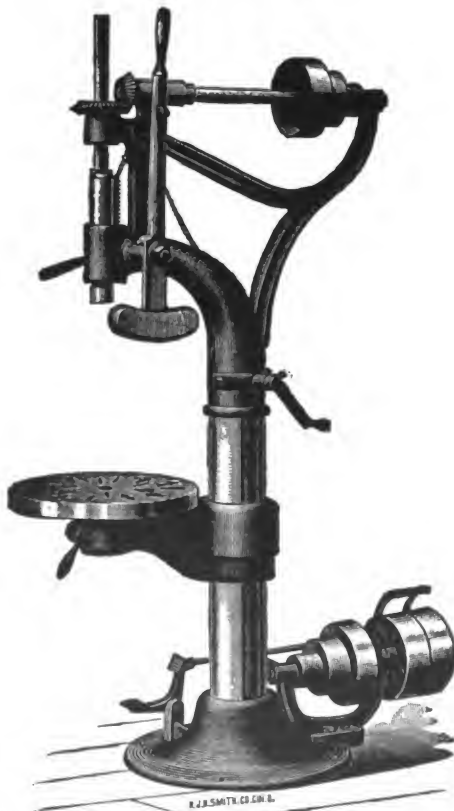


Fig. 850, 20 inch.

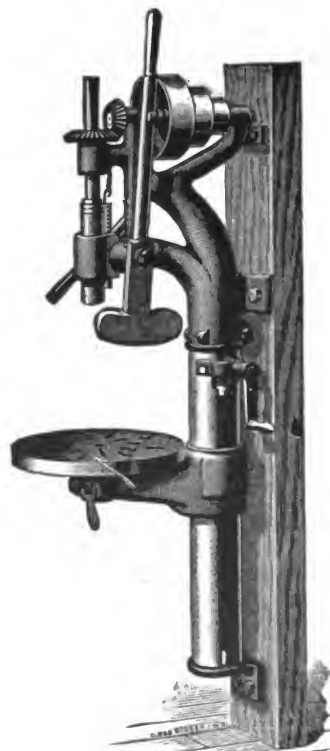


Fig. 727, 19 inch.

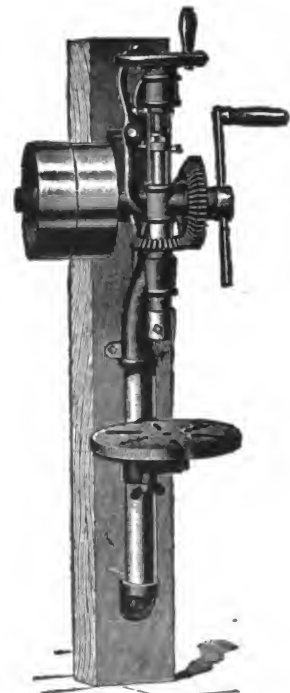
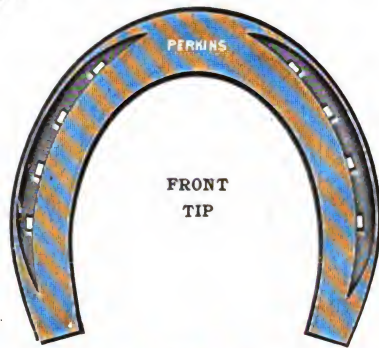
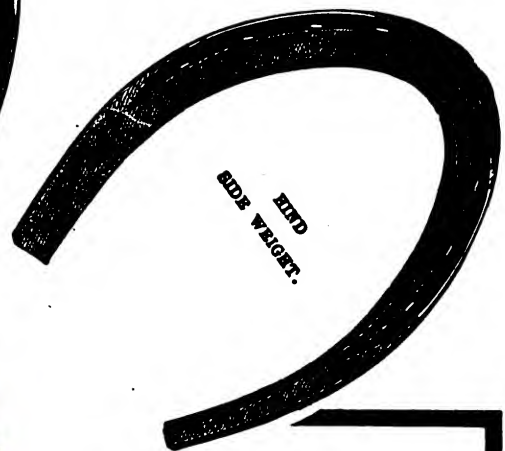
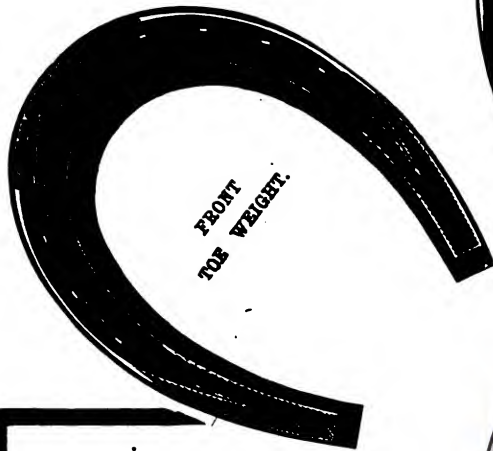


Fig. 746, No. 12.



★**PERKINS**★  
HORSE SHOES  
AND  
TOE CALKS  
THE **STAR** BRAND

★**PERKINS**★  
HORSE SHOES  
AND  
TOE CALKS  
The **SUPERIOR** Kind



**PERKINS**  
**SHOES**

Have more points of superiority than any other make. An up-to-date shoe for up-to-date Blacksmiths. .

OUR  
Complete  
Catalogue  
**SENT FREE.**  
Write Today.

**PERKINS**  
**SHOES**

Are acknowledged by all users to have no equal. Made in all Styles and Sizes. Sold at Reasonable Prices.

Send  
for Samples New  
Pattern Front  
Extra Light and Light.  
Free for asking.

**PERKINS**

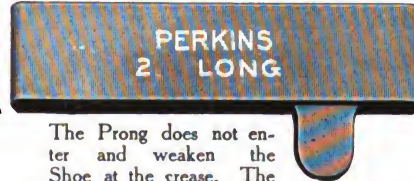
Made in Medium and Long, both blunt and sharp. Packed in 25 lb. boxes.



The Steel (our own make) is best suited for Calks; welds with sand and wears well. Perfectly graded in Length and Size.

**TOE CALKS**

Chisel Pointed Prong. These cuts show exact size of No. 2. **SAMPLES SENT FREE.**



The Prong does not enter and weaken the Shoe at the crease. The only slightly curved Calk sold.

—MANUFACTURED BY—

**RHODE ISLAND PERKINS HORSE SHOE COMPANY**  
**PROVIDENCE, RHODE ISLAND.**

# THREE GOOD THINGS

"ASK THE DEALER."



The  
**ROYAL**  
WESTERN CHIEF  
BLOWER  
IS A  
**GOOD**  
Blower

## ROYAL BLOWER

Crank turns right or left.  
Its operation is easy and noiseless.  
Blast is powerful. After-blast lasting.  
Gears and Boxes are phosphor bronze and steel.  
No spiral or worm gears.  
Fan, 12 inches. Weight 100 lbs.  
Fire-pot measures 9x11½x4 in. inside.

## No. 14 DRILL.

This Drill has set the pace for all.  
It simply does everything itself.  
Seems to have brains.



THE  
WESTERN CHIEF  
DRILL  
No. 14  
Is a Good Drill

It has independent quick return by means of which the operator can rapidly withdraw the bit at will, without stopping or reversing motion of machine. Or it can be set to drill any depth desired and will automatically (whether running by power or hand) reverse itself, withdraw the bit, and start drilling again and again indefinitely; all without stopping the motion of machine, or turning it backward. This feature is independent of Drill, and need not be used unless desired.

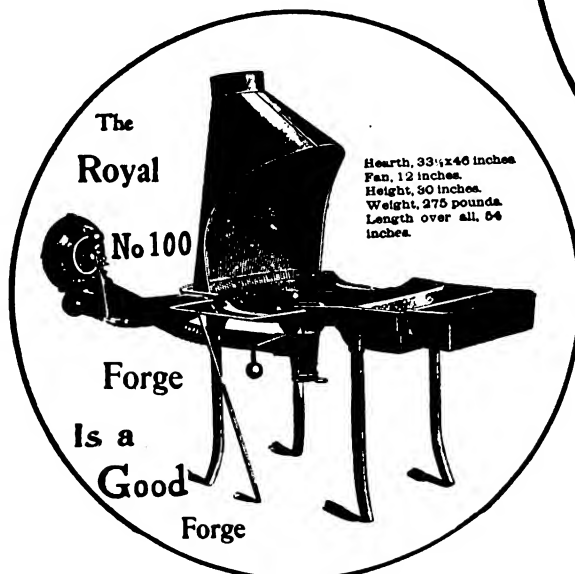
It has mechanical device for raising and lowering the table

Drills to center of 21-inch Circle.

Bores from 0 to 1½ inches.

Takes Bits ½ or 1½ Shank.

Weight, 315 pounds.



The  
Royal

No 100

Forge

Is a  
Good

Forge

Hearth, 33½x46 inches.  
Fan, 12 inches.  
Height, 90 inches.  
Weight, 275 pounds.  
Length over all, 64 inches.

No. 100 ROYAL FORGE—An all-around Forge for the lightest and heaviest work.

We have about one hundred other "GOOD THINGS" in the way of Forges, Blowers and Drills for you to select from.

## CANEDY-OTTO MFG. CO.

CHICAGO HEIGHTS, ILL.

# ROBERTSON

## —STRAIGHT—LINE—AUTOMATIC GAS AND GASOLINE ENGINES

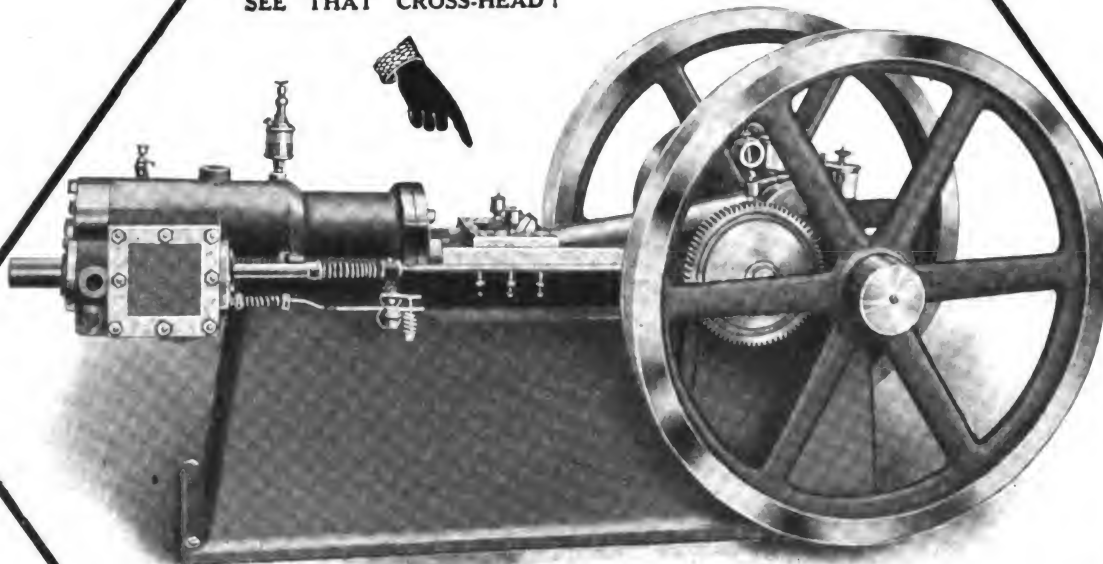
*Don't buy an Engine  
until you investigate  
the ROBERTSON  
STRAIGHT  
LINE.*

COMBINES QUALITY, ECONOMY,  
SERVICE, SIMPLICITY, RELIABILITY.  
Every Working Part on the Outside.

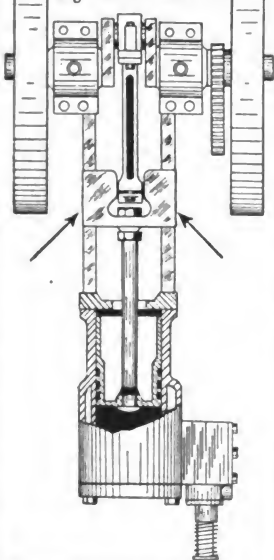
*Expressions of Users:*  
The Smoothest Running Engine.  
Always Ready when Wanted.  
Worth Double the Cost.  
The Best on Earth.  
Easiest to Start.

That ~~STRAIGHT—LINE—~~ piston saves the cylinder.  
100 PER CENT OF WEAR.

SEE THAT CROSS-HEAD!



A top view of the  
Robertson Straight  
Line Engine show-  
ing the crosshead.



### AND DON'T FORGET THIS.

These engines are equipped to operate  
without batteries, coils, hot tubes,  
etc., which give endless trouble.

No matter how slow the wheel turns the  
spark is the same and always there.

More reliable than steam power and don't  
cost half as much.

4 to 40 Horse Power.

Investigate our proposition.  
CIRCULARS SENT FREE.

**22 YEARS  
EXPERIENCE**

is worth a  
**GOOD LOT.**

BUY OUR ENGINE  
AND YOU GET  
THIS EXPERIENCE  
**FREE.**

## ROBERTSON MFG. CO.,

HIGH GRADE ENGINE BUILDERS,  
BUFFALO, N. Y.





**Will YOU be  
one of them?**

**WE** want shoers who are really anxious to build up a big pad business to get a trial order of Morgan & Wright pads from their jobbers, and compare their money-earning and business-building qualities with other brands.

**HUNDREDS** of shoers have made this experiment, and the majority of them are now using Morgan & Wright pads exclusively.

**WE** are looking for other shoers who are willing to make a fair test.

**A PAD** for every purpose—17 in all.

**MORGAN & WRIGHT PADS  
ARE GOOD PADS**

**MORGAN & WRIGHT,  
CHICAGO.**

New York, Dayton, Detroit, Atlanta,  
St. Louis, San Francisco.



## KERRIHARD'S POWER HAMMER,

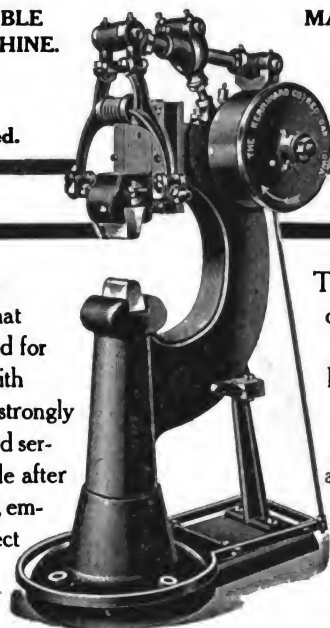
Adapted to all shop uses. Does the  
WIDEST RANGE OF WORK.

A RELIABLE  
MACHINE.

MADE BY A  
RELIABLE  
FIRM.

Every one  
Guaranteed.

Satisfaction  
Everywhere.



This is the Hammer that was designed for the blacksmith shop and is strongly built for hard service. Made after correct lines, embodies correct mechanical principles.

To give the shop owner a durable and efficient hammer, we use only the very best material and employ only the most skilled workmen. It pays to buy the best.

Height over all	-	-	55 in.
To top of Anvil Block	-	-	31 in.
Floor Space	-	-	18 x 30 in.
Weight	-	-	700 lbs.

### YOUR EQUIPMENT IS NOT COMPLETE

If your shop does not contain a Kerrihard hammer. This is the most valuable addition you could make to your outfit. The Kerrihard hammer is built right, runs right and will do your work right.

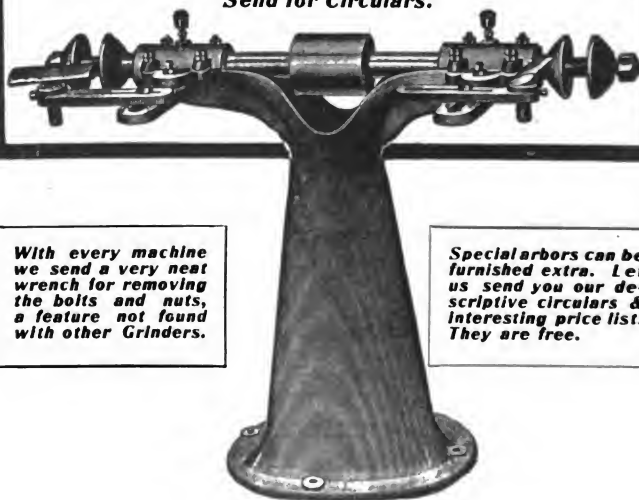
GET CIRCULARS and PRICES. SENT FREE.

**THE KERRIHARD CO.,**  
RED OAK, IOWA, U. S. A.

### OUR NEW EMERY GRINDER

is Especially designed for the Blacksmith Trade. Will Carry Wheels 20 in. in diam., 3 in. thick or smaller with 1 1/4 hole. Price most Reasonable.

Send for Circulars.

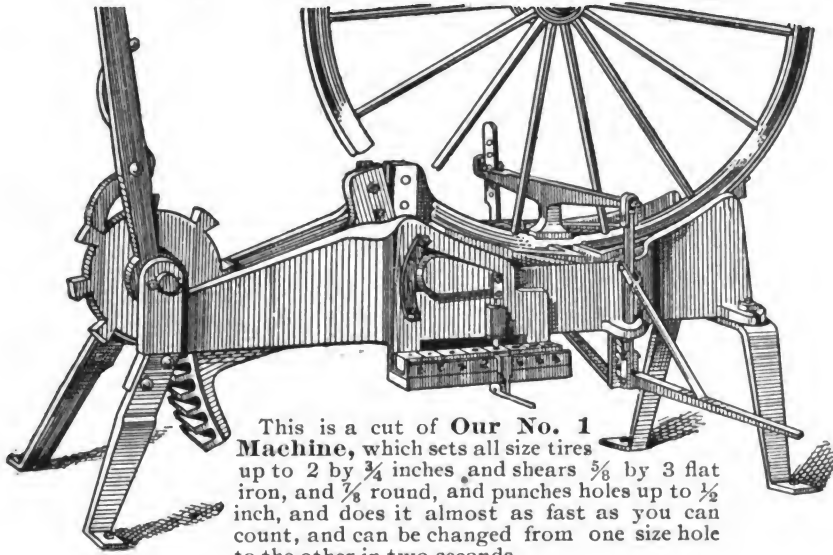


With every machine we send a very neat wrench for removing the bolts and nuts, a feature not found with other Grinders.

Special arbors can be furnished extra. Let us send you our descriptive circulars & interesting price list. They are free.



# THE IMPROVED HOUSE COLD TIRE SETTER.



This is a cut of Our No. 1 Machine, which sets all size tires up to 2 by  $\frac{3}{4}$  inches and shears  $\frac{5}{8}$  by 3 flat iron, and  $\frac{1}{2}$  round, and punches holes up to  $\frac{1}{2}$  inch, and does it almost as fast as you can count, and can be changed from one size hole to the other in two seconds.

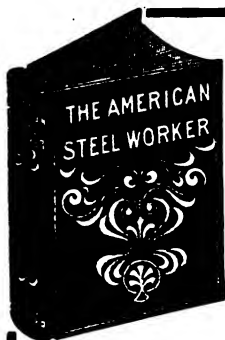
We have thousands of our machines in use and **not one is broken up, worn out or abandoned.** They cost nothing to keep in repair, and they do the work right, for the **heads move with the circle of the wheel**, pulling the tire from both ways evenly and not injuring the felloes as the so-called Tire Setters do, where the heads move back and forth on a straight line; for instance, when these heads are apart, the tallest wheel will fit down in them, but when closed as in shrinking, the curve in the heads just fits a small front wheel. You know the consequence. **Don't let them deceive you.**

Write us for catalogue and prices.

## HOUSE COLD TIRE SETTER CO.,

Office and Factory, 216-220 So. Third Street,

St. Louis, Mo.



## "BEST BOOK I EVER SAW"

Writes a blacksmith. Lots of others say so, too. Markham has been hardening steel for 27 years and studying it all the time. He tells in plain English just how to handle each case. Shows the best methods; but if you can't get them, it tells you how to do good work with what you have.

You can build a first-class furnace if you want to from his plans and use any fuel you like.

Don't think you've got this information in other books—you haven't. It isn't there. Other books may read nicely and sound well, but none of the authors has had Markham's experience, and that's what counts.

343 pages, \$2.50.

Money back if not satisfied, or sent on approval.

AMERICAN BLACKSMITH COMPANY,  
P. O. Drawer 974. BUFFALO, N. Y.

# THE Little Giant

COMBINED

## Punch and Shear.

The Most Powerful Lever Punch and Shear Made.

5 Punches and Dies with Each Machine.

MADE IN THREE SIZES.

No. 1—Will punch  $\frac{3}{8}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{3}{8}$ -inch thick and 1-inch round. Weight, 515 lbs.

No. 2—Will punch  $\frac{1}{2}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{1}{2}$ -inch thick and  $\frac{3}{4}$ -inch round. Weight, 350 lbs.

No. 3—Will punch  $\frac{3}{4}$ -inch hole in  $\frac{3}{4}$ -inch iron. Cuts iron  $\frac{3}{4}$ -inch thick and  $\frac{3}{4}$ -inch round. Weight, 280 lbs.

Only ONE operation of the Lever does the work. No changing required.

Note the Improved Stripper and Hold-down. This machine is made for the blacksmith shop, and we DO claim that it is decidedly the best on the market for that place.

For Sale by your Jobber. If not, Write Us. Send for Circular.

Little Giant Punch & Shear Co., Sparta, Ill.



# A ROYAL WESTERN CHIEF BLOWER GIVEN AWAY ABSOLUTELY FREE TO YOU.



**W**HEN you buy your supplies from us, you not only get more goods for your money, than from any other house in the United States, but you share in the profits we make on the orders you send us. Our stock of

## Blacksmiths and Wagon-Makers Supplies

is the most complete ever carried by any house, and on account of our selling our goods by catalog only, thereby eliminating the enormous expense of drummers, collectors, and book-keepers, common to all credit houses, and on account of doing a cash business only, we are able to sell our goods cheaper than any other house in the United States. Our stock of plow supplies, and spring goods, wood material and tools is very large and our prices lower than you ever heard of before. Besides, buying your goods at much lower prices than you ever paid before, **YOU SHARE IN THE PROFITS OF OUR BUSINESS, AS OUTLINED IN OUR PROFIT SHARING PLAN, BELOW.**

## OUR PROFIT SHARING PLAN.

We want to do business with every machinist, blacksmith and wagon-maker in the United States, we want to save you money on your supplies, we want to give you better goods for your money than you have been getting from your supply house, and besides this, we want you to share in the profits of the larger business we will do on account of the large orders you will send us. In order to do this, we must sell you all your supplies, and your neighbor blacksmiths or machinists, all their supplies. If you deal with us, we will please you so much with our goods and our prices that you will try to get your neighbor blacksmiths and machinists to buy from us, and you will ask your farmer customers to order their supplies from you. This will not be much work for you to do, but for doing it, we want you to share in the profits that we will make on account of the extra orders that you will get for us.

Commencing April 1st, every invoice we send out will itself be a PROFIT SHARING certificate, and when these invoices aggregate certain amounts, as shown in the PROFIT SHARING section of our No. 63 catalog, which will be ready for you May 1st, you will be entitled to very liberal premiums, according to the amount of your purchases from us. For example, when your invoices show that since April 1st, you have purchased from us, goods to the amount of one hundred dollars, return the invoices to us, and we will send you one of our Reynolds

Tire Bolting machines, absolutely free of charge and when your purchases have amounted to three hundred dollars, you will be entitled to one of our Royal Western Chief Blowers, as shown in the above illustration, absolutely free of charge, free to you as a premium and as your share of the profit we have made on your purchases and to pay you for your trouble getting orders for us. Our PROFIT SHARING SECTION will show many more useful and necessary articles that you can get absolutely free by buying your goods from us, and at the same

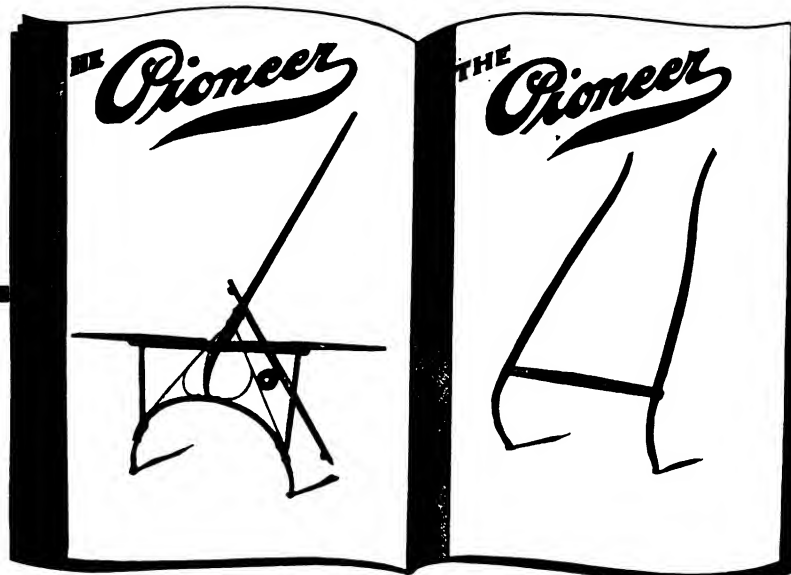
time you will be saving money for yourself because of our very low prices.

We make this very liberal offer because we want your entire trade, we want to sell you all of your supplies and tools, and we want you to work for us by getting us new customers and taking orders for us from your customers. Every order you send us after April 1st, 1906, will entitle you to a share in our profits, and even though it takes you one or two years to purchase sufficient goods to entitle you to any premium, your certificates will always be good.

Our No. 62 catalog, is the most complete blacksmiths and wagon-makers supply catalog ever issued. In it is shown a complete line of plow supplies, wagon supplies, iron, steel, and mechanics tools of every description, besides buggy tops, paper and metal roofing, garden tools, etc. And the prices we make are lower, than those of any other supply house in the United States. We want you to have one of these books, which we will send you free. The book contains nearly 200 pages, and thousands of illustrations of everything for blacksmiths, horseshoers, wagon makers, and machinists use, and at prices much lower than you ever heard of before. Send for it today, it is free to you.

## HAYSLER IRON COMPANY, KANSAS CITY, MO.

**Cheapest Blacksmiths Supply House in the United States. Send for free Catalogue.**



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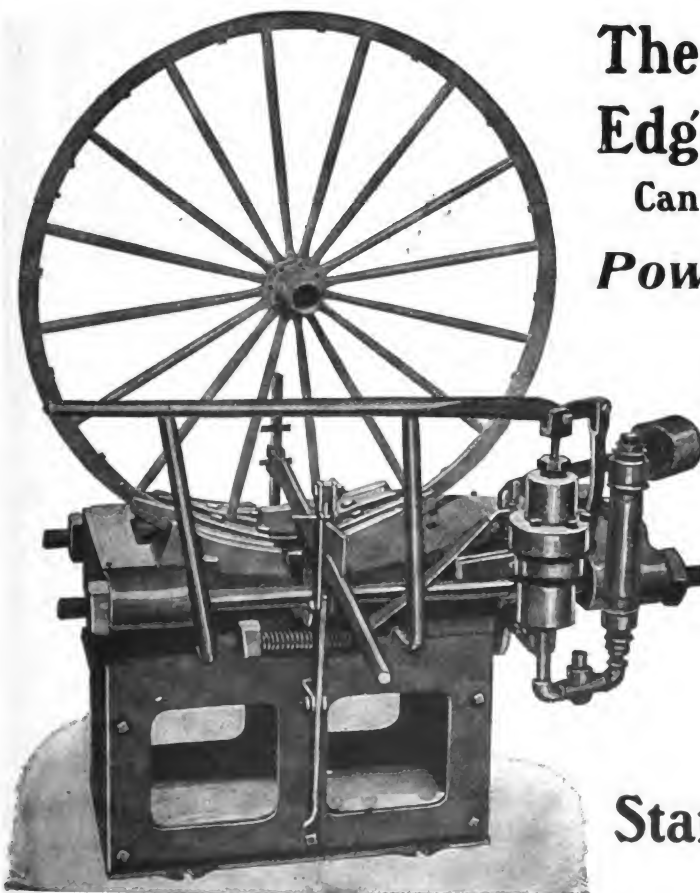
**BENDING FACTORIES:**

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***SEND FOR THIS BOOK***

**W**E would like to have your permission to send you a copy of our Catalogue, showing the different styles and sizes of poles and shafts manufactured by us. The PIONEER BRAND has been brought to a standard of excellence in quality and style by the result of years of labor and study of the trade's wants, and is recognized as the peer, as is attested to by the most critical manufacturer, and is demanded by all buyers of vehicles throughout the country. Address all communications to

**The PIONEER POLE & SHAFT CO., Piqua, Ohio.**



# **The Scientific, Hydraulic Edge Grip Cold Tire Setter**

**Can be operated by Hand or Power.**

Sets tires cold by a few strokes of a

***Powerful Hydraulic Pump.***

## **The Warranty Tells the Tale.**

It is warranted to work as well in every respect, or better, than any other edge grip tire setter and in addition is warranted to work much

## **EASIER AND QUICKER.**

These are two most valuable points in a hand power cold tire setter.

Its gripping jaws grip the tires accurately and let go quickly without the use of hammer.

**After setting over 400 tires Mr. Brown writes as follows:**

WORTHAM, Texas, February 3, 1906.

Gentlemen—In reply to your letter concerning the Scientific Tire Setter, will say that it is the easiest and quickest cold tire setter I ever saw operated. A man can set tires faster than one man can take them off and roll them in the shop and roll them out and put them on.

Yours truly,

T. L. BROWN.

**Will you buy a machine if it will work as fast as Mr. Brown says it will?**

For full information, address,

**Standard Tire Setter Co.**

**KEOKUK, IOWA**

CORRUGATED PATTERN.

**A Horse Nail that will Stand the Test of the  
Race Course Will Stand Anywhere.**

**Capewell Horse Nails are used on the Race Tracks of the Globe.**

EXAMINE THESE FACSIMILES OF  
THE NO. 2 "CAPEWELL"  
FOR TRACK WORK.

**The Tensile Strength of the Capewell Nail is One-Half  
Greater Than That of Any Other Nail Made.**

Made by **The Capewell Horse Nail Company**  
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Catalogue Free upon Application.

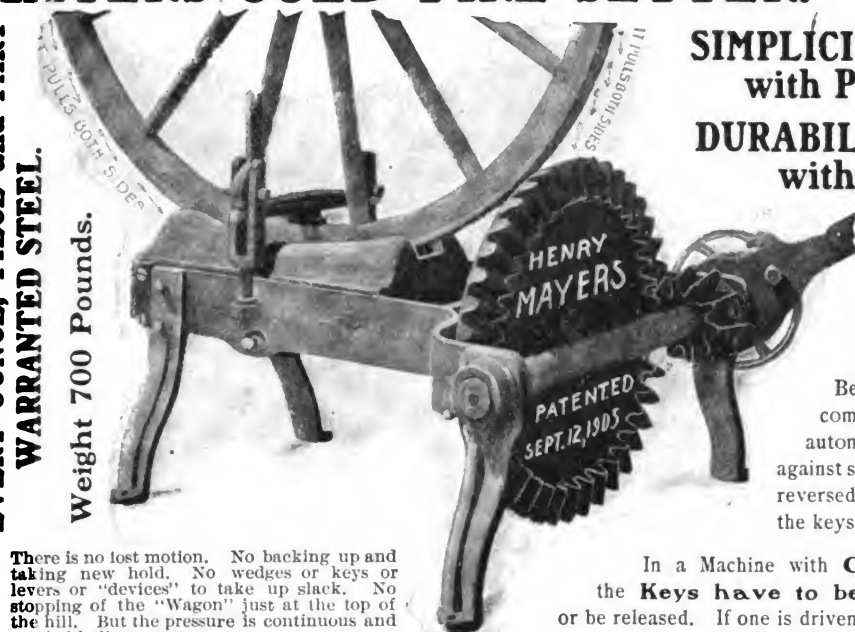
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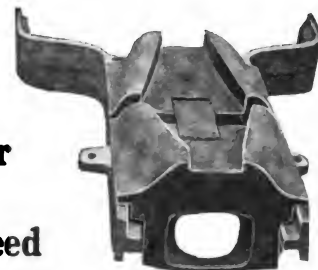
# MAYERS COLD TIRE SETTER.

EVERY OUNCE, PIECE and PART  
WARRANTED STEEL.

Weight 700 Pounds.



**SIMPLICITY**  
with Power  
**DURABILITY**  
with Speed



The only Cold Tire Setter made in which **BOTH HEADS** come together at **same time**. Both sides of the tire get the **same pressure**. A  $3\frac{1}{2}$  inch (in diameter) Machine Steel Screw with Right and Left Handed Nuts with powerful Beveled Gears does it. **Both Heads** coming together at **SAME TIME**, the Grip keys automatically take hold and set **THEMSELVES** against side of tire. After tire is set and lever is reversed and heads come apart at **SAME TIME** the keys **HAVE** to turn loose.

There is no lost motion. No backing up and taking new hold. No wedges or keys or levers or "devices" to take up slack. No stopping of the "Wagon" just at the top of the hill. But the pressure is continuous and you hold all you get.

Just turn the Screw—that's all.

In a Machine with **ONE DEAD** or **STATIONARY**, the **Keys** have to be **hammered** or **driven** to take hold or be released. If one is driven harder than the others, **Result ? Easy to see. A tire kinked SIDEWAYS.**

In our first Six Months we sold machines in Ten States. Let us send you our Catalogue, showing five views of machine, and testimonials as to its work.

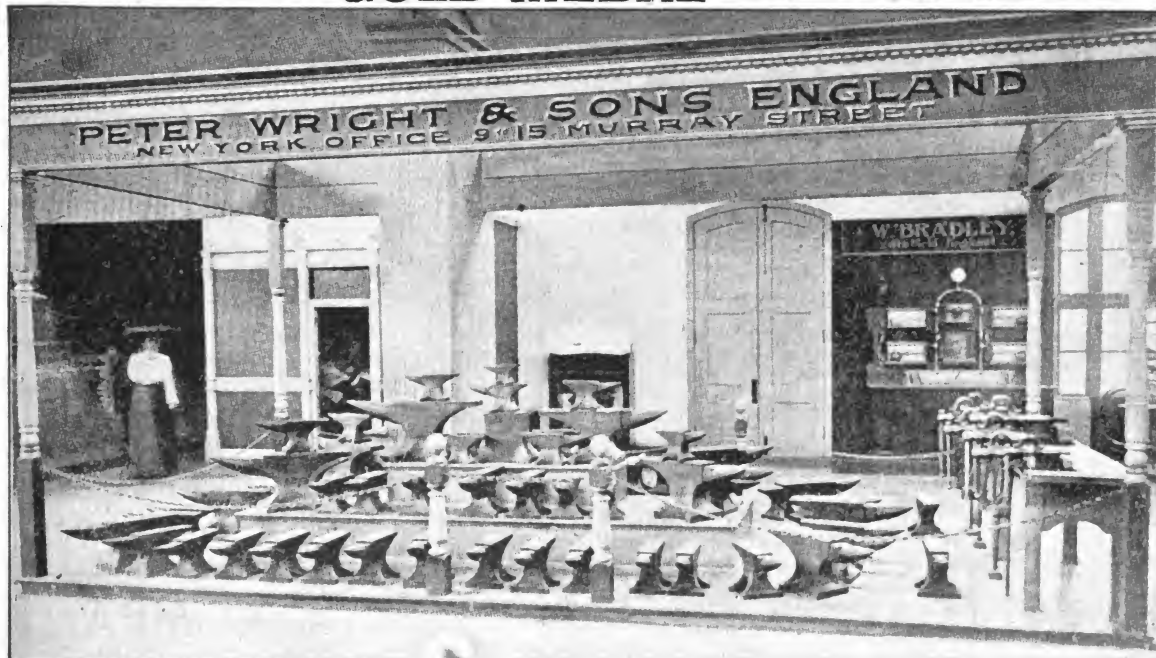
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WILL DO.

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PROPOSITION

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MACHINISTS

BEFORE.  
**AND REPAIRERS OF MACHINERY**



AFTER.

With **WELDARINE** you can braze any casting that you can get hot and make it as good as ever without patches of any kind.

With **WELDARINE** you can braze cast-iron or any form of iron or steel, cast-iron to steel or cast-iron to copper.

**WELDARINE** can be used successfully in an ordinary forge or with a brazing torch.

There is not a shop, manufacturing plant and scarcely a household in which there is not some broken cast-iron article which the owner would have repaired if it could be done neatly and at a moderate price.

**WELDARINE** at once opens up a new and **PROFITABLE** field for anyone who will cultivate it. Let it be known that you can braze cast-iron; braze a few pieces and the knowledge of it will soon get around and bring you a continually increasing amount of work.

**WELDARINE** is one of the most practical of recent discoveries and will become as staple in the blacksmith shop as sugar in the household. Sold under a positive guarantee to give perfect satisfaction by the following Jobbers:

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I have given your "**Weldarine**" a thorough test and find it to be just what you claim it to be.  
**BAILEY REPAIR CO.**

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One set of **WELDARINE** will do from \$50 to \$75 worth of work. Costs you \$4 per set. Put up in four packages and quick kleaner in a neat wooden box.

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If your Jobber is not at this time handling **WELDARINE**, send us \$1.00 for a sample set of **WELDARINE** that will do from \$10 to \$15 worth of work, or \$4.00 for full working set. Sent charges prepaid, to any address.

Satisfaction guaranteed or money refunded.

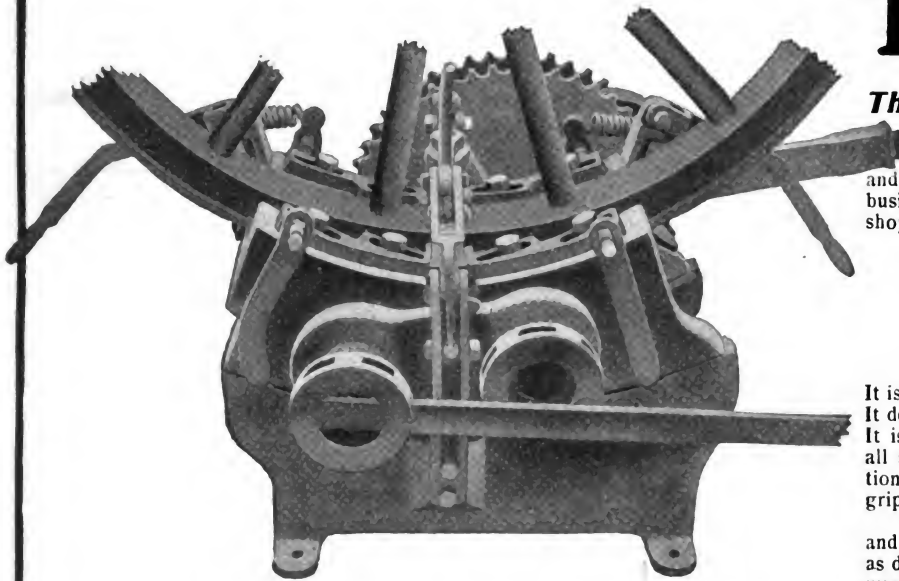
Kindly give us name of your Jobber, and we will arrange for him to supply your future needs.

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**The Only Machine that has stood the Government Tests**

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**A Machine for up-setting tires cold while on the wheels**

It is unnecessary to remove the bolts to upset a tire. It does its work in the most accurate and rapid way. It is durable and simple in construction, and sets all sizes of tires up to four inches. Its high reputation was long established before any other edge grip cold tire setter, now on the market, was built.

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All the essential parts required to make the most successful machine, are covered by our patents. To use our construction means to infringe. It is the only machine that has a key adjusting device which prevents the keys from slipping on the tire. With all other makes a hammer and punch or a wrench has to be used to accomplish this, which is very unsatisfactory to the user.

**REMEMBER** time and experience must precede perfection. The Brooks is manufactured by the longest established and most experienced builders of edge grip cold tire setters in the United States.

**It is Shipped on Trial, fully Warranted, and sold on easy payments.**

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**THE BROOKS TIRE MACHINE COMPANY,**

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**Our Trade Mark**

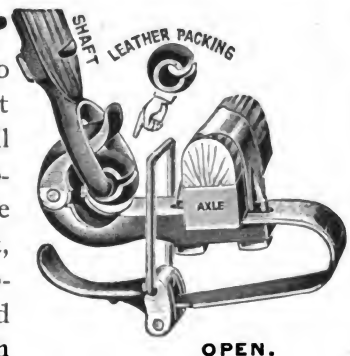
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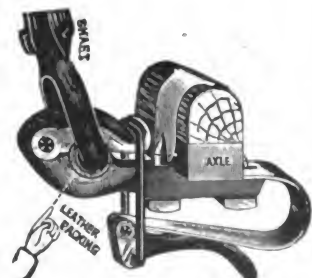
A left hand will do as well. We are willing to hold up our right hand and swear that we are the original makers of a Ball Bearing, Leather Packed Shaft Coupling, that **Bradley Couplings** are Drop Forged from Bar Steel, are Silent, Quick Shifting, Self Lubricating, Automatically take up their own wear and will outwear any vehicle to which they are attached. There are over a million pairs in use. Quality and advantages considered, they are the cheapest and best couplings on the market.

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The letter "B" appears on the head of each nail.



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The **EQUAL** of ANY Nail except  
**"NEW STANDARD."****DEALERS' NET PRICES TO SHOERS.**

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Box.....	\$3.25	3.00	2.85	2.75	2.70	2.65	2.65	2.65
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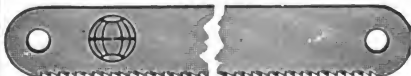
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will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



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**NATIONAL SELF-OILING STEEL TUBULAR AXLES**

Now made  
of high  
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Guaranteed to be stronger and more rigid than solid steel axles. We make both. Write us

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A GOOD  
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THAT  
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BODY  
GOOD



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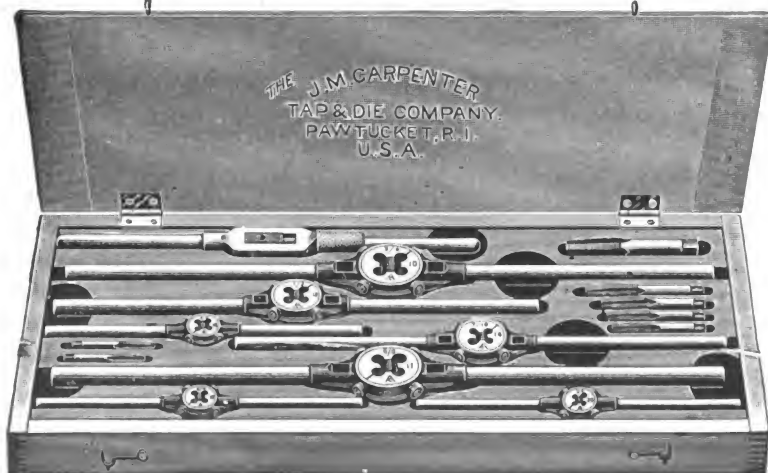
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FULL MOUNTED DIE SETS**

With a stock for each die and the Original Nichols Tap Wrench.

Before buying a die set you should see **Carpenter's** and you will have no other make.

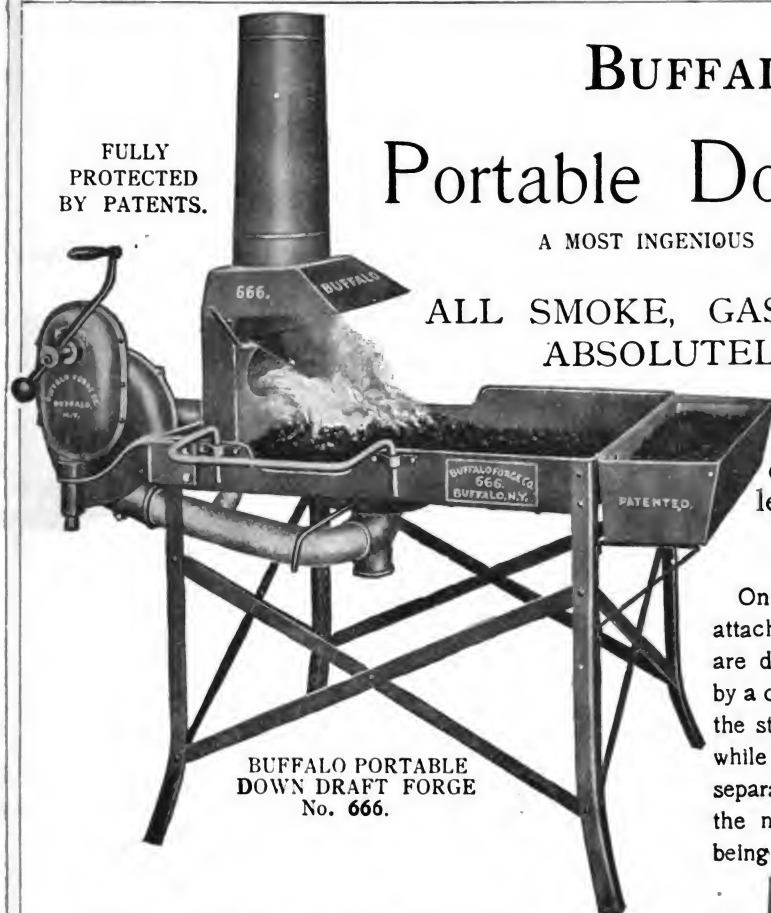
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FULLY  
PROTECTED  
BY PATENTS.



BUFFALO PORTABLE  
DOWN DRAFT FORGE  
No. 666.

## BUFFALO No. 666

# Portable Down Draft Forge

A MOST INGENIOUS APPLICATION OF THE BUFFALO DOWN  
DRAFT SYSTEM.

ALL SMOKE, GASES, FUMES AND CINDERS  
ABSOLUTELY DONE AWAY WITH.

The hottest flames and stifling heat  
can no longer cause the smith such dis-  
comfort as he has hitherto been com-  
pelled to submit to.

## HOW THEY WORK

On turning the crank of the powerful No. 200 Blower  
attached to this forge, all smoke and gases from the fire  
are drawn into the stack by means of the draft produced  
by a connection to fan case. The larger part escapes up  
the stack by reason of the natural and induced draft  
while a portion passes through the fan into tuyere. A  
separate connection from blast pipe into stack strengthens  
the natural draft and is of great service when fire is  
being started.

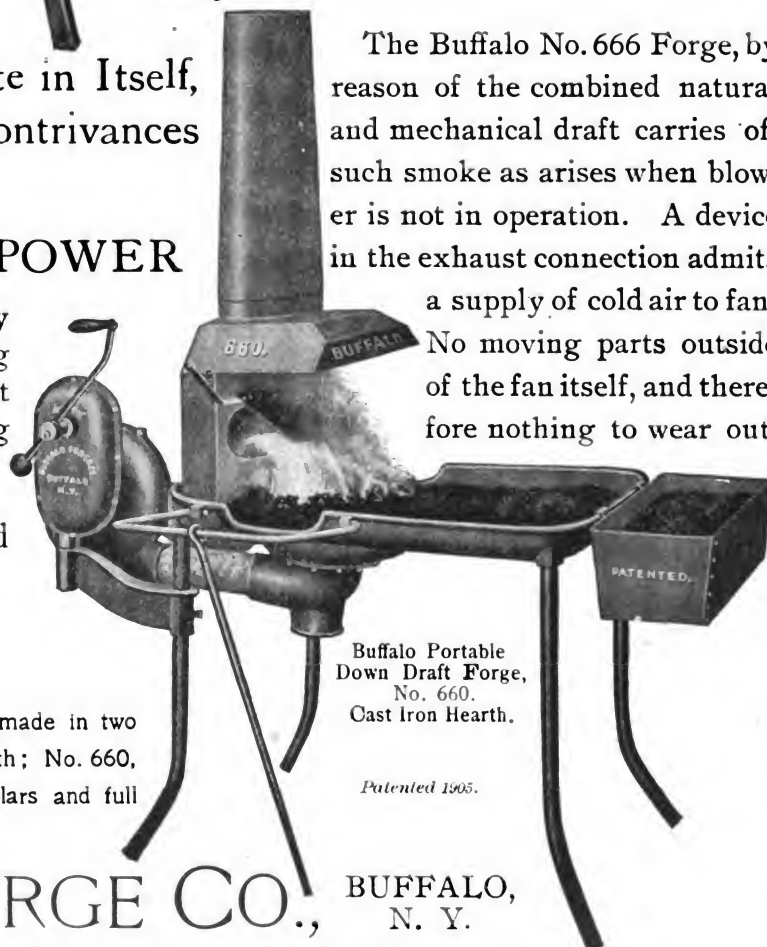
Every Forge is Complete in Itself,  
and Needs no Exterior Contrivances  
Whatever.

## NO ADDITIONAL POWER

No additional power is necessary  
to operate blower. In place of taking  
air at the fan case, blower takes it  
from over the fire, producing a strong  
draft without extra effort.

Put in a Buffalo No. 666 and  
keep the Smithy Clean,  
Cool and Light.

Buffalo Portable Down Draft Forges are made in two  
styles: No. 666 made with Steel Plate Hearth; No. 660,  
made with Cast Iron Hearth. Send for circulars and full  
particulars.



Buffalo Portable  
Down Draft Forge,  
No. 660.  
Cast Iron Hearth.

Patented 1905.

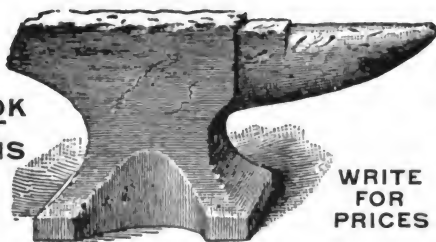
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BUFFALO,  
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THE CANADIAN BUFFALO FORGE CO., Ltd. MONTREAL.

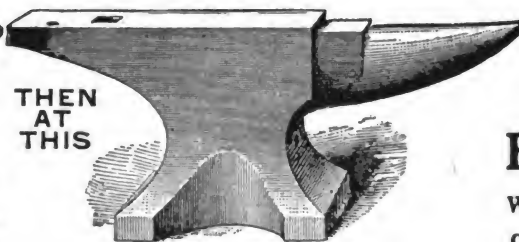
**NO MATTER HOW BADLY THEY ARE BROKEN WE CAN REPAIR THEM IN GOOD SHAPE**

LOOK  
AT  
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WRITE  
FOR  
PRICES

THEN  
AT  
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**Columbus  
Anvil and  
Forging Co.,**

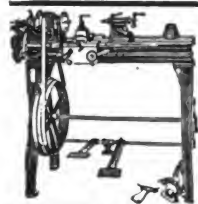
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COLUMBUS, OHIO.

**WE ARE EXPERTS AT REPAIRING OLD WROUGHT ANVILS.**  
WE ALSO MANUFACTURE THE CELEBRATED ARM AND HAMMER BRAND ANVIL.

ASK YOUR DEALER FOR THEM.

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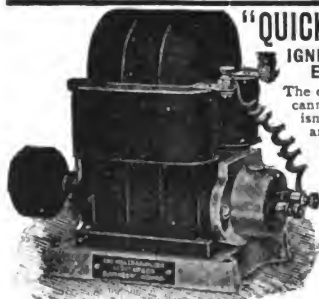
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Carroll-Jameson Machine  
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IGNITING DYNAMOS  
Excel All Others!

The only generator that cannot lose its magnetism. For either make and break, or jump spark work. Also spark coils. Send for Catalogue B.

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"The world's standard for efficiency"

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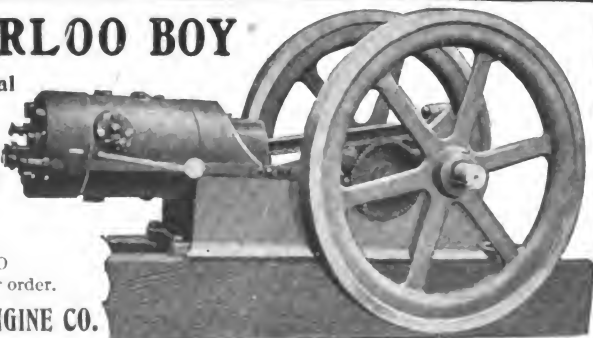
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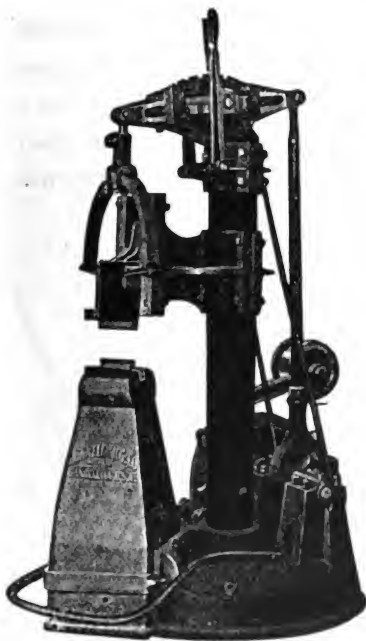
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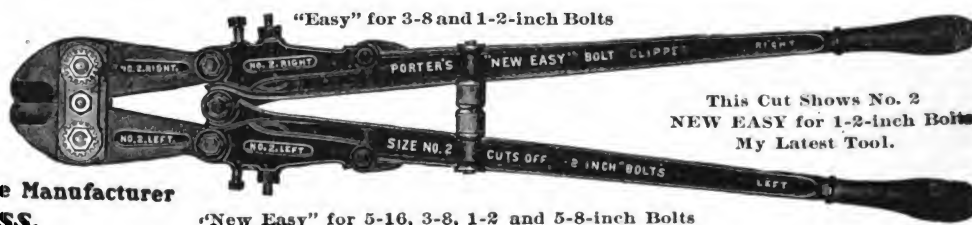
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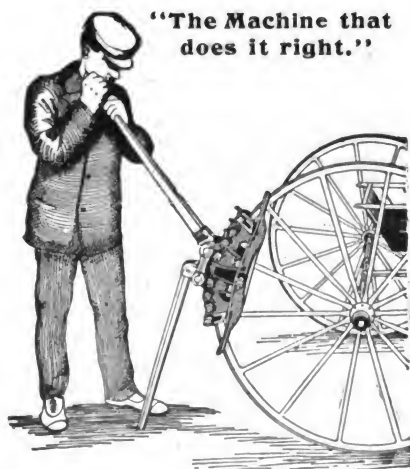


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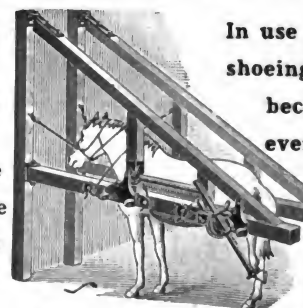
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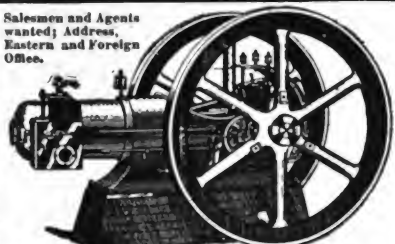
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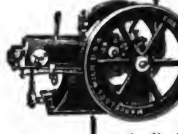
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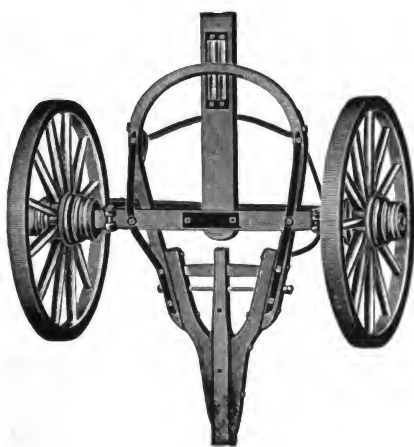
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# THE "DEFIANCE"

## BAND SAWS AND SWING SAWS

Guaranteed to Give Perfect Satisfaction.

## CIRCULARS

NOW

READY.

Our new combination Saw Table is made with Tilting Table and furnished either with or without Boring Attachment. Write for information.

THE SIDNEY TOOL CO.,

SIDNEY, OHIO.

32-inch Band Saw, which we also make in 27-inch and 36-inch sizes.





A Good Set of Bit Brace Nut Wrenches is almost a necessity. A postal sent to us will bring net delivered price.



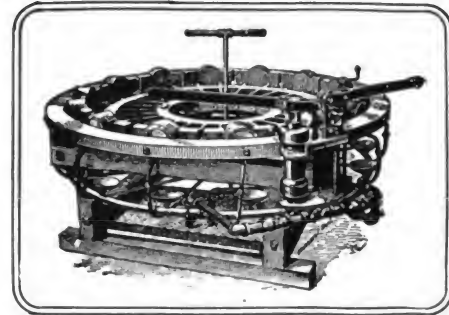
Do you want a Screw Plate cutting  $\frac{1}{4}$  to  $\frac{3}{4}$ ? Now is a good time to buy. Send for price delivered to nearest R. R. Station. CATALOG FREE

## DON'T BUY A SCREW PLATE

—Until you know what the "REECE" IMPROVED SCREW PLATES cost and have heard our arguments in their favor. It Pays to look around before you buy and find out all you can about the different makes. You will find that the "REECE" SCREW PLATES have more points of **REAL MERIT** than any other kind. You will find that you always get about what you pay for. Low prices mean cheap goods. Our prices are not excessive and when you get a "REECE" SCREW PLATE you get one that will cost only a trifle more than a cheap screw plate and outwear two of them. Quality counts every time.

SOLE MANUFACTURERS  
**THE E. F. REECE CO.,**  
GREENFIELD, MASS., U. S. A.

## The West Hydraulic Tire Setter



Is a **Round Machine** for tiring **Round Wheels**, and compresses the tire at all points—not all in one spot—and the compression is so slight at any particular point that tire bolts do not have to be removed when resetting an old tire, neither are holes closed so bolts are tight in tire. Wheel is made compact and joints tight.

WRITE US YOUR REQUIREMENTS.

## The West Tire Setter Company

ROCHESTER, N. Y.

## THE ENGINE YOU NEED!

BALANCE WHEELS TURNED TRUE.

Look at the Picture Carefully.

Simplicity and Perfection in Design can be seen at a glance. Lubrication is Reliable and this you know is a **VITAL POINT**.

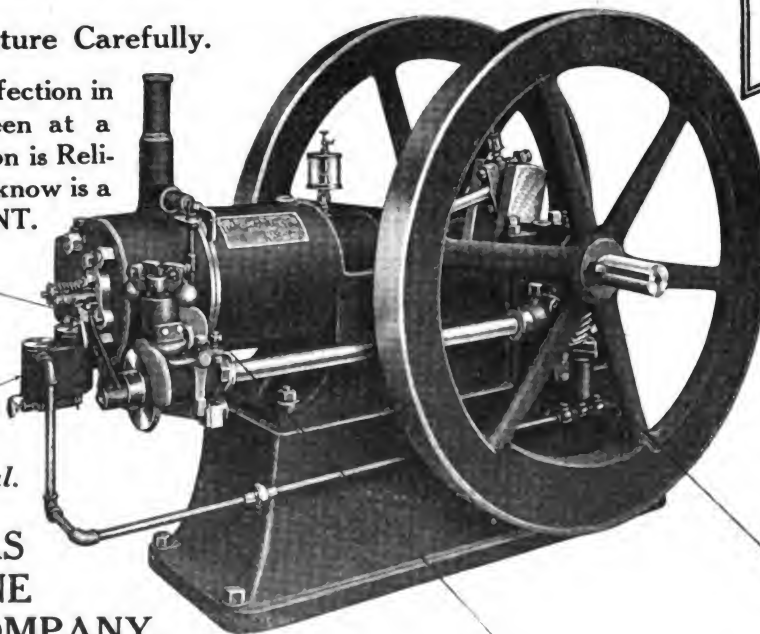
Electric Spark

Weber Patent Vapor Mixer.

Bearings are Frictionless Metal.

**WEBER GAS & GASOLINE ENGINE COMPANY,**

Box V 1114, KANSAS CITY, MO.  
Catalogue Free.



*The Governor*

is a **HIGH SPEED** type and is the **BEST** for

**Quick Action**

AND

**Economy**

IN

**Fuel.**

*This Gasoline Pump Reduces Insurance.*

Your Fingers will turn **GOVERNOR NUT** to adjust **SPEED**, and you **DO NOT NEED TO STOP ENGINE.**

Quality

**"Firestone"****FIRESTONE TIRES.**

In the sale of rubber vehicle tires, your success will depend upon the excellence of the tires you handle.

You cannot afford to recommend to your customer anything but the best if you expect to hold their trade.

Better tires than the **FIRESTONE** are not produced. They are carefully made by men who are masters at the art of tire making, and the materials used in their manufacture is not excelled for purity.

We have earned a reputation that we prize highly and propose to sustain it by making only the best tires to be found in the market.

Write for particulars.

**FIRESTONE TIRE & RUBBER CO.,**  
AKRON, OHIO.

## BRANCHES:

New York, 1788 Broadway. Chicago, 1442 Michigan Ave.  
Boston, 9 Park Square. St. Louis, 2226 Olive St.  
Philadelphia, 211 W. Broad. Detroit, 240 Jefferson Ave.

CLEVELAND  
& TOOLSCLEVELAND  
& TOOLS

**QUALITY  
COUNTS**  
and that is just why  
"CLEVELAND DRILLS"  
are so popular with  
the best mechanics.  
ALWAYS IN THE LEAD.

**"CLEVELAND"  
DRILLS AND REAMERS**

ARE SOLD BY

**All Principal Dealers.**

MANUFACTURED BY  
**THE CLEVELAND  
TWIST DRILL CO.,**

Office and Factory, CLEVELAND, O.  
NEW YORK STORE, 62 READE ST.  
CHICAGO STORE, 17 SO. CANAL ST.

CATALOGUE  
FREE.  
Write us.

CLEVELAND  
& TOOLSCLEVELAND  
& TOOLS**SINCE 1847**

Holroyd goods have been giving perfect satisfaction to the trade. For clean cutting screw plates and taps and dies of finest quality and accuracy, there are none better. Write us today for a copy of the "Brown Book." Free to the trade upon request.

**HOLROYD & CO.** WATERFORD  
NEW YORK.

European Agents, THE FAIRBANKS CO., 70-80 City Road, London, E. C.

**GOOD YEAR**  
**HOOF PADS**  
**SAVE HORSES' FEET**

**THE EASY**

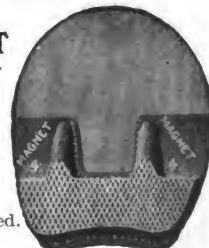
Extra Heavy,  
Leather Back.  
Has the Rubber  
where it is needed.  
Prevents strains,  
corns and other  
foot troubles.

**THE NIAGARA**

White rubber exposed leather back.



**THE MAGNET  
BLACK**  
Medium weight,  
Leather back.



**THE NOBLE**  
Canvas back,  
Heavy, fully guaranteed.

**THE GOODYEAR TIRE & RUBBER CO., AKRON, OHIO.**

Branches at Boston, Chicago, Denver, New York, San Francisco and Los Angeles.

# THE AMERICAN BLACKSMITH

A Practical Journal of Blacksmithing and Wagonmaking

VOLUME 5

MAY, 1906

NUMBER 8

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## The Steel Industry.

The past year has seen such marvelous strides in the production of steel that the popular question in this field has been; Will it last? Can the country continue to care for such vast outputs of steel? Can the industry again market twenty millions of tons of the product as it did in 1905? Those of the inner circle—they who know of the capabilities of steel for creating new fields of use, predict even greater things for this industry.

The steel car was undoubtedly the prime mover in giving the steel industry its forward impetus in 1905, and in like manner the steel tie and the steel wheel are heralded as the mainstay for some little time to come.

A look into the history of the steel industry reveals the fact that but 25 years ago the steel rail was practically the sum and substance of the trade, this branch being almost half the total tonnage produced. Today, other branches of the industry are found to have so far advanced as to predict that the steel wire and rod production alone will overshadow the steel rail branch of the steel industry.

That the steel tie, once established

in use, will increase considerably the demands on the steel trade, is quickly shown by a glance at the miles of railroads likely to renew ties, those in process of construction and those in contemplation.

The steel industry promises, not only to continue its enormous output, but to increase it and that too despite any possible temporary setbacks likely to affect other industries. The range of employment for steel has continued to widen until one is tempted to believe that its uses have no limit.

## The Disaster on the Pacific Coast.

We hear predictions of the San Francisco of the future, and the dust of tumbled buildings and the smoke of burned dwellings have barely settled. The awful news had hardly touched the wire before the purses of the American people were opened to aid the army of unfortunates. Money was forthcoming from every quarter to help the poor people on the coast and it is evident that not only the hearts but the purses of the great American public are in the right place. If money were needed to aid the sufferers it would be on hand. How comforting to feel that we have a government able to promptly supply hundreds of thousands of dollars and thousands of rations to suffering and starving people. The awful occasion makes plain the fact that the American people are very closely allied; that city is bound to city and that one's misfortune is the misfortune of all.

The San Francisco of the future is to be a city of steel; frame construction having proved a delusion. An authority says that San Francisco will probably use 250,000 tons of steel within the next two or three years. While this may at first appear a large enough figure to affect the steel market, the total output of the steel mills is so immense as to make no material difference. Redwood, which up to this time, had been considered practically

immune from destruction by fire, will also give way to steel construction.

## What Power has Done for the Craft.

Power in the shop has received the attention of the trade press until the craftsmen who think power doesn't pay are few and far between. And rightly so, for cases in the smith shop, where power would be unprofitable are indeed rare. The smith thinking his business too small to warrant the installation of power is in a fair way of always having a small business. But the craftsmen who figures that power will enable him to go after newer and larger trade, and then take proper care of an increased patronage, is the man most likely to build a large shop of his own. Power is directly responsible for a large amount of trade which the smith would never receive through any other channel. And the smith who hesitates to install power in his shop must certainly fall out of line in the fight for larger patronage.

Power has enabled the smith to enter into competition with the manufacturer and to manufacture small specialties for which it has been his good fortune to find a market. It has made a larger field possible for him, and has accordingly helped to swell his purse. It has made a better business man of him, and given him a higher standing in the business world. It has brought better shops, machines and equipment to the craft and has made a higher standard of work possible. In short, power has lifted and raised the standard of the trade as no other one thing in craft history.

## House Cleaning Time at the Shop.

GEO. F. WHERRY.

In the first place, a shop should have a good floor, high enough from the ground to let the air circulate under it. Second, good windows and doors so as to admit of good ventilation and third, keep floor clean by removing all

refuse every day. And change water often in the slack tub. Have a place for everything, and keep everything in its place, so that one can find it in a moment. Keep all jobbing tools on a rack within reach. Keep all bar iron and steel in separate racks. Keep all tools clean and in good order, so that when one wants to use a tool of any kind, one doesn't have to put the tool in order. Keep the floor clean from any and all kinds of tools and irons, so that one can walk without stumbling. In fact, keep your shop in such condition that you are not ashamed to have any lady enter it. By the way, the ladies compliment me on the way I keep my shop, and very often they come in to watch me at

made similar to a bolt cutter with the exception the blade or cutters are beveled both ways instead of one way, so that one can split the nuts and remove them about ten times as fast as by any other way. I have also a home-made anvil punch, can punch round or square iron and steel from  $\frac{1}{8}$  to  $\frac{1}{4}$  of an inch thick. This beats drilling all hollow. Mine is not so expensive as the machine punches.

### Why Young Men do not Learn the Trade.

HOMER.

This is a subject I have given considerable thought; the conclusion I have arrived at is that the trouble is with the boys. They set too high a

have in mind a man who will make all kinds of bargains to keep a boy, even to signing papers. But about the time the boy should get a fire, the man will be so mean that the boy leaves. When questioned he will say that the boy left of his own accord.

I have talked to a good many lads and have tried to get them to see the benefit of a good trade, but most of them say they cannot live on the wages. But I ask, "What are you going to do? You will want a wife and family, how are you going to get along then?" "Oh, I think I will do somehow;" that is the answer I get. It is strange they can't see that it is far better to work for small wages and learn something that in later years will insure at least living wages.

Now, boys, just take my advice and learn some trade. Don't despise the good old trade of Tubal Cain, it may not be as clean nor it may not be as easy as some, but it will always bring you work. And when you begin smithing make up your mind to be the best smith. This will insure you the best wages. To the master smiths; don't forget you were once a boy and asked questions.

### Floral Designs in Wrought Iron.

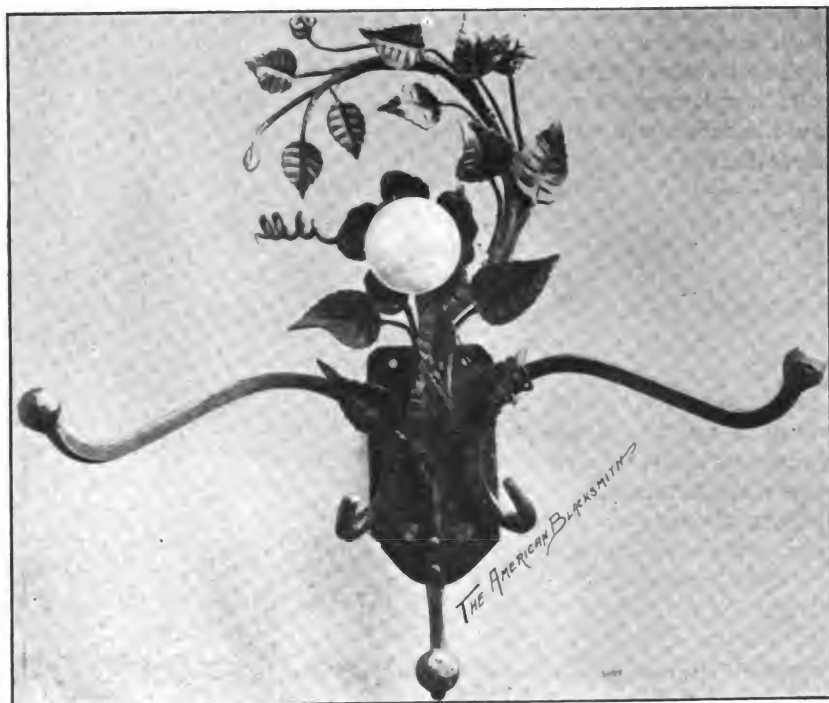
There is probably no other branch of design which will test the skill of the metal worker more than flowers, and there is nothing in which he can show his skill to better advantage. The two examples of artistic iron work, shown this month, give a good idea of what can be done with floral designs and while the leaves of the rose pattern lack the naturalness and grace of nature, both, on the whole, are very artistic. The thistle design is very graceful and the leaves of this piece show the marked skill of the worker. The frosted globes for the lights add much to the beauty of these pieces and will suggest to the progressive craft worker that electroliers in wrought iron should prove especially beautiful and find a ready sale.

Both these examples of wrought iron works were executed at the Illinois State Reformatory.

### New Form of Farm Wagon Warranty.

E. W. McCULLOUGH,  
Sec'y. N. W. M. A.

During the past twenty-five years various forms of warranties have been adopted by wagon makers, but owing



FLORAL DESIGNS SHOW THE SKILL OF THE WORKER TO GOOD ADVANTAGE.

my work, and I usually keep good seats for them.

Regarding tools, would suggest that all of the craft keep the best tools needed in this line of business; I try to do so, and find it a great advantage. I find that the tool makers are just giving us the kind of tools that we should have had 50 years ago. And I, for one, intend to take advantage of it by buying the most up-to-date tools I can find for both jobbing and shoeing, and when I can't find what I want, I will make it myself.

For example, I tried all the drummers and several stores for a tool to remove nuts quickly from fellow bolts. Couldn't find anything at all; result, I made two myself. These tools are

value on their services. It is true some masters take all they can get out of a boy and when they find he has awakened to the fact, they find some way to oust him. I have in mind two such men. One had a boy for some time. The time for the annual fair arrived and the man wished to go. But not wishing to leave the place alone, he told the boy to clean up the grounds and hoe the garden, after which he could go into the shop and fix up some things. These jobs were not in line with the trade the boy wished to learn, and as soon as the man's back was turned, the boy went into the shop, gathered up the tongs, welded the jaws good and tight. He then struck out for new fields. I



to the insistence of some for excessive detail there has always been a lack of uniformity. The following form, recommended by the National Wagon Manufacturers Association to its members and all manufacturers is to issue in triplicate; one for the factory, one for the dealer and one for the purchaser.

#### WARRANTY.

This wagon is sold and purchased under the following conditions of Warranty: That it is well made of good, thoroughly seasoned material and of sufficient strength to carry the weight mentioned in our catalogue. Should any breakage occur within six months from date of sale to the user, resulting from workmanship or material clearly defective, new parts will be furnished to the dealer free of charge (except where defects are small and can be repaired at less cost) or, at the option of the factory, an amount equal to the price charged the dealer will be paid in cash.

In no event will the manufacturer be held liable for any damages other than replacing or repairing without charge defective parts as above stated.

All claims under this warranty must be made by the purchaser in writing on blanks furnished by the manufacturer to the dealer from whom the wagon was bought within five days after the defect was discovered by the purchaser, and the parts claimed to be defective delivered to the dealer and held by him subject to our order. In event of purchaser changing place of residence, report can be made to any dealer handling this make of wagon or to manufacturer direct.

When broken or defective parts are requested returned to the factory, they must be plainly tagged stating from whom shipped, and letter with bill of lading enclosed, written us giving date of sale, to whom, the size of the wagon, and full information as to the usage of the wagon and cause of breakage. Claims for parts returned to factory or for cash paid by the dealer for repairs must be sent to the factory within sixty days from date of allowance by dealer.

Seat springs are not warranted, as they are thoroughly tested before leaving factory.

This warranty shall not cover the splitting of wagon box sides and ends, the checking of hubs, nor the bending or springing of iron, steel or tubular axles, nor wagons that have been loaded beyond their capacity as given in our catalogue.

One copy of this warranty must be sent to the manufacturer promptly, and this warranty is not binding unless the terms under which wagon was purchased from dealer have been fulfilled.

BLANK WAGON CO., EVERYWHERE, U. S. A.  
Date of sale ..... 190 ..

..... Dealer.  
..... Purchaser.  
Size .... Our Catalogue Capacity ..... lbs.

(To be signed by both dealer and purchaser).

The following form of blank for the filing of claims under the warranty is also provided for.

#### CLAIM FOR NEW PARTS OF WAGON TO REPLACE BROKEN PARTS.

I ..... of ..... in the County of ..... State of ..... hereby state on Honor, that the breakage of the following described parts, ..... of ..... Wagon, which bears the serial number ..... on

its rear axle, and which I purchased from ..... of ..... on the ..... day of ..... 190 .. was not due to my fault, or to the fault of any person in my employ, or to that of any person who has been using the Wagon; and, further, that the breakage was not the result of any accident.

I further state, On Honor, that the Wagon was never, at any time, while I have owned it, been loaded with weight exceeding ..... lbs., as provided in the Warranty I hold upon it.

In my judgment the breakage was due, either to defective material, or bad workmanship, and cannot properly be attributed to any other cause, and I believe it just and right that the broken parts should be replaced as provided in the Warranty.

I will deliver the broken parts to ..... at ..... store in ..... to be shipped back to factory upon receipt of new parts to replace them.

WITNESS my hand at ..... this ..... day of ..... 190 ..

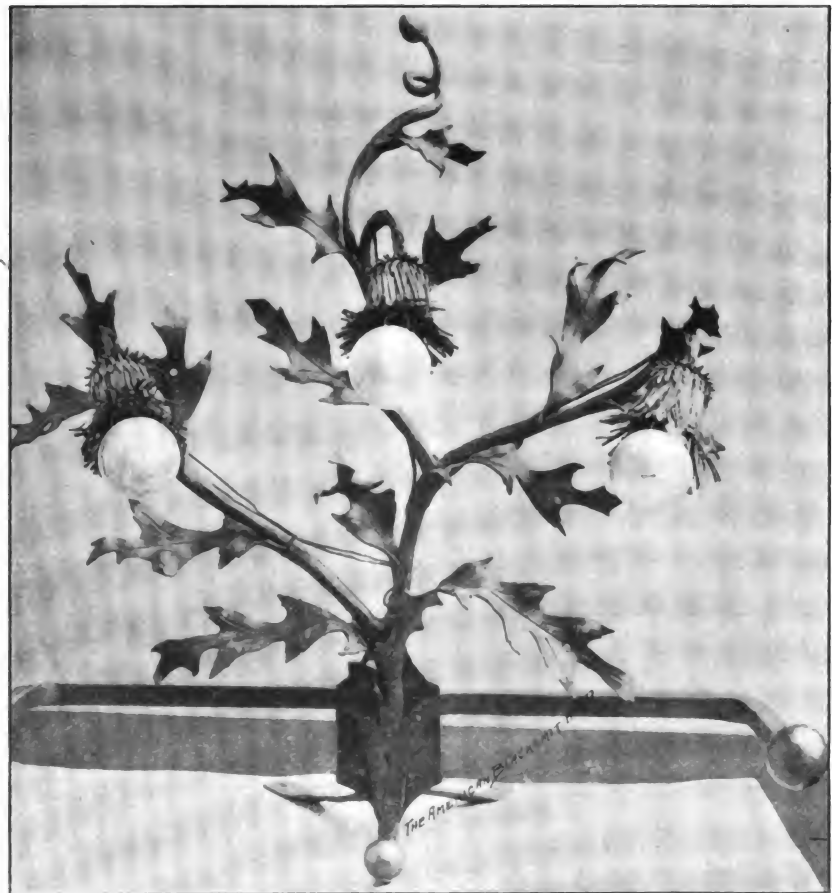
PURCHASER

The idea of issuing this form in triplicate is to insure a clear understand-

The life of the warranty has been changed to read "Six months from date of sale to user," which is equivalent to from nine months to over a year from the time the wagon leaves the factory. The large percentage of just claims for replacement are made within 90 days of the purchase of the wagon, and by four or five months' use the wagon has been thoroughly tried, so that claims filed after that length of time are largely of a doubtful or unjust character.

The manufacturer in retaining the option of either replacing the defective parts with new ones or instructing that repairs be made at place of sale, protects the consumer from unnecessary delays which would occur in the exchange from distant points.

The Claim blank is supplied in quantity to the dealer, and is nothing more



AN ARTISTIC FLORAL DESIGN IN WROUGHT IRON.

ing between manufacturer, dealer and consumer. It gives the manufacturer a record of the transaction and enables him to do justice to the consumer. It gives the dealer an easy reference to the date of sale, etc., when demands are made of him for repairs. It gives the consumer the right to claim repairs at any agency where the same make of wagon is sold.

than an honest statement that breakage occurred through defect and not abuse or accident: no claimant, whose cause is just, will object to making such a statement, and a large percentage of doubtful and unjust claims will not be made.

The requirement of the dealer to send broken parts to the factory in a specified manner and to present all

repair claims to the factory within 60 days is simply to keep all repair claims moving until disposed of, leaving no old scores to adjust later. The manufacturer provides protection for the dealer, by requiring the user to comply with the terms of purchase before the warranty becomes effective.

It is expected that these forms will become effective July 1st.

### Cheap Jobs and Holding Trade.

JAS. N. NEVILLS.

How often we are confronted with a job which a customer is unwilling to spend a reasonable amount upon to repair properly. Such was the following case:

A customer brought in a wheel which looked to me very much like the old Indian's gun—needed a new lock, stock and barrel. The tire on this wheel had been loose for so long that the tenons on the spokes were beyond wedging. To do the job without respoking the wheel or cutting it down very much was the problem and I solved it as follows: My first step, after removing the tire and rim, was to gauge the spokes down  $\frac{3}{4}$  of an inch and bore down with a hollow auger to the gauge marks. This gave the spokes new shoulders. I then put on new rims. Then I melted some tea lead (the lining from tea chests, procured at the grocery) and poured it in around the tenons. This filled the space solidly around the tenons. I then set the tire and turned out a very good job for the money. The wheel is giving as good service as it ever did. My customer is satisfied and that's all we need do to hold our trade.

### Wagon Lettering for the Vehicle Painter.—1.

F. L. MARVIN.

It is not the writers' intention, in these articles, to teach the would-be letter artist how to startle the vehicle painting world with marvelous creations in the line of wagon lettering, but simply to bring out such points and observations as will enable the jobbing shop painter, with a fair knowledge of design, to execute the lettering required of him with some degree of skill and artistic effect.

We will take for granted that the prospective letterer understands his colors, paints and pigments thoroughly and aside from a suggestion now and then we will not touch upon this branch of the painting art.

The subject of proper tools is of

such importance to the wagon letterer that a brief talk on brushes is absolutely essential to an article of this kind and the first thing the would-be letter artist should do, is to procure a good set of what in trade speech are called "letterers." The size and number of brushes is to be determined by the range and class of work to be executed, but their quality should be the best procurable. Good work is impossible without good tools and with reasonably good care a set of letterers will last the artist a long time before showing wear.

After securing the proper tools I think it best for the student to practice with the tools he intends to handle

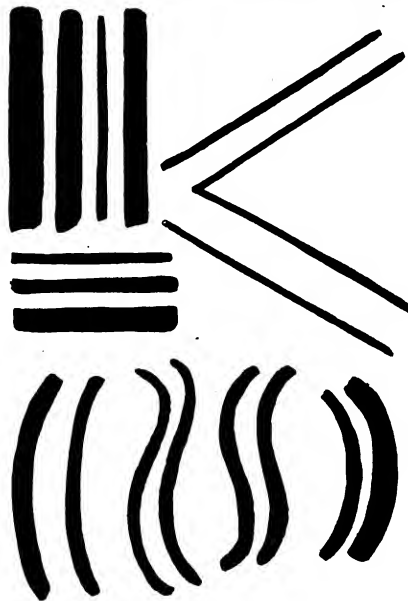


FIG. 1.—WAGON LETTERING FOR THE VEHICLE PAINTER.

when employed in actual lettering. Many teachers and authorities advise practicing with crayon or chalk, but I believe that the best practice for the beginner is to get as close to actual lettering conditions as possible. While the practice with crayon or chalk and a blackboard is very well, the student will advance much more rapidly by way of the brush method.

In practice the beginner should confine himself to making the strokes which go to make the letters of the alphabet. Fig. 1 shows the lines to be practiced. After thoroughly mastering these, and getting the hand and arm to make them with little effort, the work may advance directly to the making of letters. Choosing the simpler ones first, of course, and gradually working into the more difficult letters and characters.

When practicing the strokes or forming letters have the brush the width

of the line and keep it so to the end of the stroke. When at the end of the stroke lift your brush up quickly. This will give a sharp, square bottom to your stroke. Keep the brush perpendicular as much as possible and use its point only. It will save you much trouble and keep your brushes in better condition. Don't allow the brush to spread out in every direction. Keep its bristles together as though of one piece of soft flexible material. Don't work the brush dry. Always have sufficient paint on its bristles to allow them to work freely.

Right here let me say that finely executed lettering is only a part of the wagon letterers art. The arrangement of the wording is of equal importance. Many an elegantly lettered wagon loses its value as an advertising medium owing to the fact that the letters are difficult to decipher. The plainer and more easily read, the announcement on the side of the wagon, the better for the main object of the lettering—to advertise.

(To be continued)

### A Word to Beginners.

FREMONT KELLEY.

When a lame horse comes to your shop, carefully examine his shoe and see how the calks are worn. You can tell by these where the greatest weight has been, and if he has been balanced or not. If the outside heel calk is worn low, and the inside calk is high, it indicates that the heel calks are not thrown far enough out to be under the direct weight of the body coming upon it. Now examine the toe calk, if it is worn on the outside also, it likewise is not far enough out.

I have seen smiths who, in order to stop such difficulty, will put on side calks. This does not change the line of weight on the shoe. But it increases the friction surface, therefore not relieving the strain on the ankle, nor taking the weight off the outside heel, which will impede its growth or crush it in. This in either case will twist or throw the ankle off to one side. Now, the weight being mostly on the one side, leaves the other side to grow, consequently throwing the ankle still further. In the first treatment of such a case, be very careful not to pare the foot much lower on the high side than it was before, because the sudden change will make the horse more lame than ever. Just take off a little at each shoeing, but be sure to throw both heel calks under

the low side, (or just swing them to that side). Also set the toe calk over to the same side, and keep strict watch to see what a change you will make in the growth of a crooked foot. Breaking down of the wall or bruising the foot causes corns, so if the horse is lame, pare out the crushed part of the horn only, and clean out between the bruise and the wall. And if a corn shows itself pare it out also. After the shoe is set, dip a piece of cotton into some hot sealing wax, and crowd

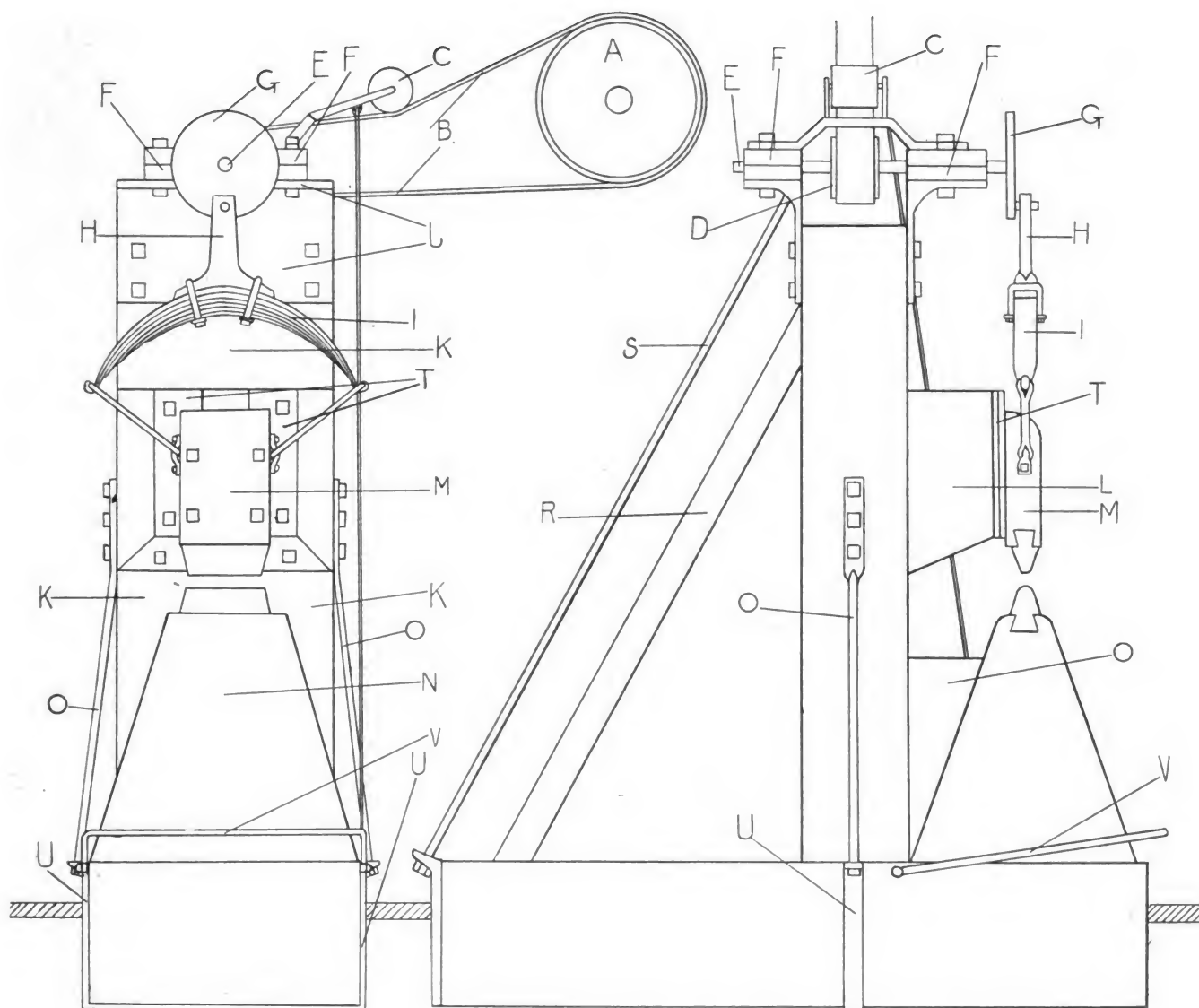
ing down of the joints which means inflammation, contraction, lameness, ringbone and finally a worthless horse.

### A Home-made Power Hammer.

H. S. HODGES.

The accompanying engravings show a front view and also a side view of a home-made power hammer which I made this winter. So far it is a perfect success. I have a 3-horse power Stover engine with which I run my machines and tools.

transmitting power to the hammer pulley, D. The belt tightener is shown at C. The boxing F is of hardwood and babbitted to receive the shaft E. The wrist wheel for lifting the hammer is shown at G and was taken from an old separator. The pitman rod, H connects the wrist wheel with the spring; the rod being fastened to the spring with clevises. The spring, I is a 6-leaf from a carriage. The brackets, JJ were made from a binder-wheel rim and are 10-inches wide. The post,



A FRONT ELEVATION AND SIDE ELEVATION OF THE HOME-MADE POWER HAMMER.

it under the shoe into the cavity of the corn. Now, that you have changed the weight, you will most likely never be troubled with that corn again but if it still bothers, give it the same treatment. But do not think that possibly the corn was the only thing that bothered the horse and still go on and shoe him in the same way. Of course the corn in this case is not the most serious. It is the crush-

Every part of this power hammer, with the exception of the casting, I made myself. The large casting used for the anvil was cast at the foundry.

The following explanation, will I think, give the reader all the information needed for building a similar hammer. The dimensions will be found about right for all general shop work.

A, represents the driver pulley and shaft around which runs the belt B,

K is 5 feet high and is mortised into the foundation block P. The block, L holds the face plate, T which guides the hammer. The face plate is made with a channel to receive a T on the back of the hammer, thus guiding the hammer head, L when in use. The hammer head alone weighs 50 pounds. The casting, N for the anvil weighs 820 pounds. This I had made at the foundry. The block between the cast-

ing and post is shown at O. The foundation block, P is 2 feet wide by 17 inches thick by 6 feet long. It is almost unnecessary to say that this piece must be from good solid lumber. The side braces, QQ are of 1-inch round stock, flattened at top ends and threaded at their lower ends to receive bolts. The back brace, R is of 4-inch lumber. This is further supplemented by a  $\frac{1}{2}$ -inch rod, S. T, represents the face plate. An anchor brace, U runs under the foundation block and holds the side braces, QQ. The foot lever, V connects with the belt-tightener by means of a rod at the side of the hammer.

#### A Question for the Author of Tubal Cain

In the following lines Mr. Dayton O. Shaw asks the author of "Tubal Cain" a question. The same question no doubt, occurred to other readers after reading the poem in the March issue.

The author and writer of Tubal Cain,  
Shows talent that may lead him to fame.

The boys like to read his poetry no doubt  
But one thing more we want to find out;

If Tubal Cain, the first metal made,  
Pray tell us where he learned his trade.

#### Why A Vehicle Runs Correctly.

L. VAN DORIN

Some of the readers of THE AMERICAN BLACKSMITH might no doubt be interested in the principles that cause

tongue; 6, hind axle, 7, front axle.

It must be remembered, that it is just as important to see that each gear, (hind and front) are properly lined as it is to have the axles properly set. Hence, the distance from the hold back iron on point of pole, to each spindle point of front axle, as indicated by dotted lines should be the same. Also from the kingbolt hole in end of reach, to each spindle of hind axle, as per dotted lines the same.

Then the axles should be so set that the distance between the front and back of wheels as per dotted lines will measure the same. Then if the wheels come any way near standing on a plumb spoke, the wagon is bound to run well, it can't get away from it. We attach more importance in having the wheels stand parallel with the reach and pole, than we do to standing on a plumb spoke.

The above rule should be understood by every blacksmith and wagon maker. Though you may not build new work, when a customer tells you his wagon doesn't run good you are supposed to know how to find the cause and the remedy.

We have been building wagons for 48 years and have proved the above rule by experience. Don't be afraid to try it, it isn't an experiment.

#### Th Smith as a Business Man.

O. W. TAYLOR.

Blacksmiths, as well as other men should run their business on business principles. This should be done in various ways, one of which is the keeping

for various jobs, thus oft-times getting a job by showing the man that he is paying the same price that the other fellow paid for his job.

The smith should at all times keep himself well posted on the prices of various articles used in the shop, so that he can promptly and correctly make out a bill for a man while he is waiting, no matter if it is for a job done, or one of which he would like to know the cost. In making out a bill always take into consideration the amount of stock used as well as the time required to do the work, add a small profit to the stock used, and so much an hour for time and don't be ashamed to tell him what you charge him per hour. In this way you gain his confidence for he sees you do business in a business-like manner.

The business world of to-day is always in a hurry. Therefore, unless he is situated in the city where he can at all times get things on short notice, the smith must at all times keep on hand a good supply of stock to meet the demands of his customers. Or he can also be favorably situated in the country, i.e., along a trolley line, a stage route and especially if he has telephone service.

Giving your customers a job as soon as they ask for it is one way of success. And when the people know that you are doing that, it will bring many customers your way. Never promise a job for a certain time, if you know that you cannot do it, for that is down-hill business. Always

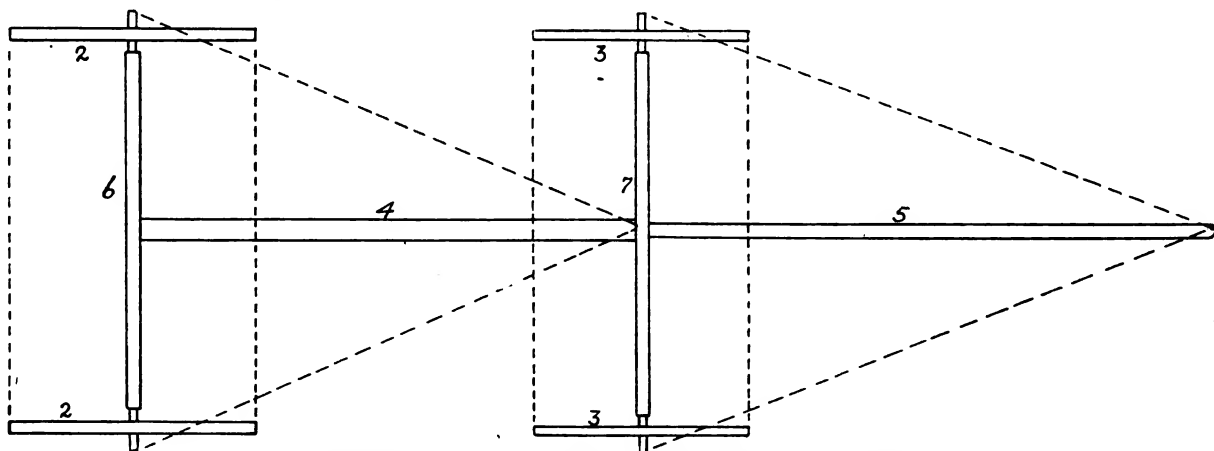


DIAGRAM ILLUSTRATING WHY A VEHICLE RUNS CORRECTLY.

a vehicle to run well. I therefore submit a sketch with the aid of which I hope to explain a principle, that we have proven by experience, to be correct. The figures in the engraving are as follows: 2-2 represent hind wheels; 3-3 front wheels; 4, reach; 5, pole or

of strict accounts of all work done, cash or credit. This is profitable for the following reasons: You can at all times tell to a cent the amount of work done in a day, week, month or year: You can at all times see just what you have charged your customers

have the job done when your customer calls for it; is an excellent motto. Never to guarantee a job unless you know positively that it will give satisfaction, is also good business.

I wonder how many of the brothers got all the money that they worked



for during the year. I feel proud in being able to say that I got every cent that I worked for during the year with one exception. A stranger working on the trolley road which passes our place got me for a few dollars last summer. This was not my fault however, as I handed in my bill to the company. The boss to whom I gave it lost it, and did not see me until the next week. The man had by that time quit the job, and drew his money and also mine.

### How to Temper Gun Springs.

T. S. HOLLOWAY.

First it is very necessary to know how to hammer a spring in forging it. To insure a good job, never hammer a spring edge wise after you have drawn it near the thickness you want your spring. Hammer it flat. If it is too wide, cut it off with a file or chisel. After finishing and shaping your spring ready for tempering, proceed in the following manner, and you will have no trouble in getting your springs to stand: Heat your spring to an even red and plunge into a ladle of raw linseed oil. Now pour out part of the oil, leaving enough to partially cover spring. Now set the ladle on the fire, and burn the oil off. When the oil has stopped blazing on the spring, dump it out, let it lie until cool, then put it in the gun. If you have hammered your spring properly and shaped it properly, using this method of tempering, you can be safe in guaranteeing your springs. I temper all my small springs in this manner and guarantee all of them. I find the best spring steel to be Firth & Son's of England.

### A Case of Miniature Shoes.

The accompanying engraving shows a case of miniature horse shoes forged and turned by Mr. Robert R. Jones of Syracuse, N. Y. The name was made with full size horse nails. By comparing the shoes with the length of the nails some idea can be gotten of the size of the little shoes. The chain of twelve shoes surrounding the picture of Mr. Jones, was made of one piece of iron without any welding. The four linked shoes to the right of the picture were also constructed in the same manner. The horses limb was forged from  $\frac{3}{4}$ -inch square stock. Mr. Jones says, when sending in the photograph "This piece of art in horse shoes, finger ring, sleeve and collar buttons, hoof hook,

stick pins and anvils may be of interest to some of the craft."

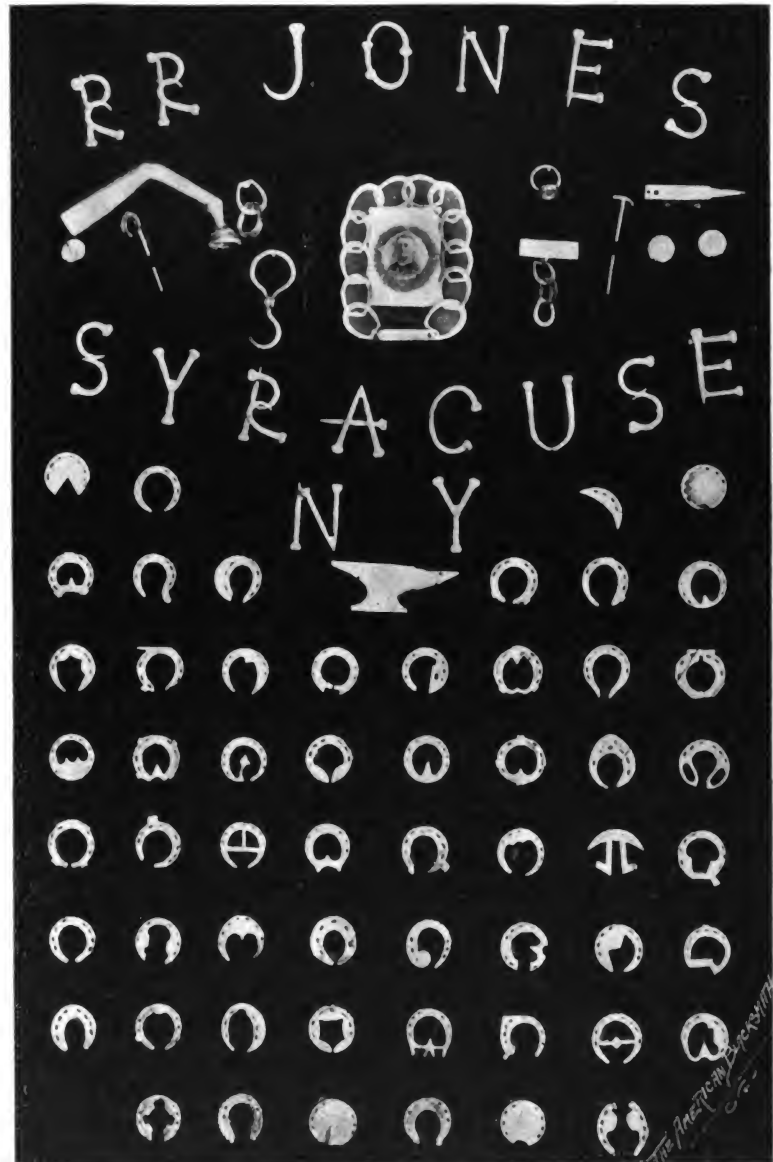
### How to Get the Full Value of Your Journal.

H. D. BARTON.

For some time I realized that by simply reading every issue of THE AMERICAN BLACKSMITH as it came to

four volumes all neatly bound) and working evenings indexed or entered on the cards all the articles, items and information, with its location (page number and volume) that is likely to be of value to me in my work.

In indexing the subjects all cards were made out for their respective headings as I proceeded. To explain;



A CASE OF MINIATURE SHOES.

me, I could not get all that was in it. So after thinking for some little time on how I could get the full value of everything that the paper contained, I hit upon the following index system: I secured a cigar box and fixed the cover to hinge at the end instead of the side of it. Then I purchased cards of a size to fit inside the box easily. These cards were ruled lengthwise with blue lines  $\frac{1}{8}$  of an inch apart. I now took all my back numbers of THE AMERICAN BLACKSMITH (I have my

we find on page 53 of a certain number an article on "interfering behind." We mark one of the cards "Interfering" at the top and write "Hind" on one of the lines with the number of the volume, issue and page following. Of course all other articles dealing with hind interfering are simply indexed after the first entry by volume, issue and page. Should more than one card be used for any one subject (I found many cases of this) number each card and keep them in numerical order.

Some of the readers may wonder why the subject of "Interfering" is not entered under "Horseshoeing." The reason is that there are a sufficient number of articles on interfering as to make a special card necessary. A careful and observant reader will have noticed this.

Now, all my back numbers being indexed, I simply take care of each current number as I read it, not, necessarily entering them on the cards but using any little slip and later transferring the items at my leisure. When indexing the articles I put down the location of every item whether a long article or an item of only two or three lines. Another thing, should I run across some valuable kink incidently mentioned in an article I also index that. In fact I index every drop of information on my card.

There may be other systems of keeping in touch with the full value of a publication but I do not believe any system is more thorough than mine. It keeps your papers in good condition—no cutting or clipping, it enables you to find articles on any subject immediately and last but by no means, least makes you a better workman in every way.

### The Diamond Point for Repointing Shovels.

C. W. METCALF.

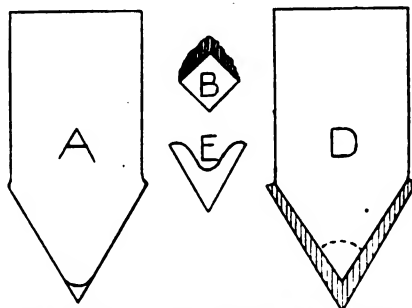
As it is about time for plow work, I send a short sketch on pointing shovels. In 24 years of experience, I have found that the diamond point gives the best results. The illustration at A, will give an idea of how much a very small piece of steel will add to the looks of a wornout shovel. First, cut your points from a piece of steel,  $1\frac{1}{4}$ -inches wide, and cut in a diamond shape like B. Scarf the end as shown at C and then heat your shovel, bend the point back a little and place your point on so it will project out about  $\frac{3}{4}$  of an inch. Now grip with your tongs, take a light heat on the point, loosen tongs, and weld the remainder. In drawing the point with your hammer draw towards the point. You can make your point at least  $\frac{3}{4}$  of an inch longer by so doing. It will also leave it full in the center, and will be just as neat as the factory made, as shown at D. A great many use the old fashioned swallow-tail point, as shown at E. But we find that they make the shovel too heavy. We also find that when they wear down, a hole will wear through at the fork of the point. The diamond point on the contrary, makes

that spot thicker, and the shovel is more durable and is lighter. And a light tool will do just as good work as a heavy one.

### Don'ts for the Craft. For the Vehicle Painter.

W. J. SYMONS.

Don't use poor paints.  
Don't practice too much.  
Don't use unreliable varnishes.  
Don't say "that's good enough."  
Don't forget that water is cheap.  
Don't wash a vehicle in the sun.  
Don't forget to stir your paint.  
Don't forget to putty thoroughly.  
Don't forget to strain your paint.  
Don't use any but the best brushes.  
Don't get excited when varnishing.  
Don't think that you know it all.  
Don't use dirty sponges or dirty water.  
Don't raise a dust in the varnish room.  
Don't use a varnish brush in paint.  
Don't paint over any charred spots.  
Don't guess at the price a job should be.  
Don't think sandpapering unimportant.  
Don't place a dirty brush in any color.  
Don't use soap when washing a vehicle.  
Don't allow your brushes to get hard.  
Don't allow paint to dry in the pots.  
Don't forget that practice makes perfect.



THE DIAMOND POINT FOR REPOINTING SHOVELS.

Don't burn the wood when burning-off paint.  
Don't forget that varnish is most exacting.  
Don't allow water to remain on the vehicle.  
Don't think that a job can be kept too clean.  
Don't be afraid to take pains with your work.  
Don't forget that a job well puttied is half-done.  
Don't forget to strain the varnish before using.  
Don't try to restore a brush that is "hard as a rock."  
Don't use the same sponge on panels and running gear.  
Don't forget that sandpapering is an exacting operation.

Don't use a cheap unreliable torch when burning off.  
Don't be afraid to use plenty of water when washing up.  
Don't allow a brush to rest on its bristles when not in use.  
Don't forget to look for leaks in the paint department.  
Don't "wipe out" your brushes on the paint-shop walls.  
Don't wear your "Sunday clothes" around a paint room.  
Don't buy varnish by the barrel when you use it by the pint.  
Don't fail to keep the windows closed on dusty, windy days.  
Don't waste anything; time and material are both money.  
Don't allow a busy pipe or cigar in the painting department.  
Don't be afraid to use plenty of elbow grease when "rubbing up."  
Don't allow greasy rags to lie around the shop,—it's dangerous.  
Don't forget to cut japan with turps. before adding it to the paint.  
Don't forget that warm turpentine will restore the soggy brush.  
Don't do work as your father did; times and people have changed.  
Don't sweep the varnish room floor without sprinkling damp sawdust.  
Don't paint over screw and nail holes without filling them with putty.  
Don't say "the paint shop doesn't pay" unless you've investigated.  
Don't think that book knowledge ever made a finished vehicle painter.  
Don't think that well-spattered overalls mean "ambitious workman."  
Don't fail to cover the fine carriages when not in a dust-proof room.  
Don't forget that a good brush-keeper can be made at little or no cost.  
Don't say that a job will be done at a specified time, unless you mean it.  
Don't forget that cheese cloth makes admirable color and varnish strain-ers.  
Don't forget that old paint is easily removed with benzine and sandpaper.  
Don't allow the folding top to remain down any longer than is absolutely necessary.  
Don't guess at anything in the paint shop; whether in working, selling or buying.  
Don't forget that sandpapering begins before even the priming coat is put on.  
Don't allow the finished vehicle to remain outside until the owner calls for it.

- Don't forget that the "cool" workman is best able to meet and master emergencies.
- Don't use any powder or patent preparation in the water when washing a vehicle.
- Don't say "that brand isn't worth a continental" unless you have followed directions.
- Don't think that because a certain method has been used for ten years, that it is correct.
- Don't daub a clean, neatly sandpapered job with paint full of skins and specks—use a strainer.
- Don't forget that the dirt and grit in an old sponge will in 10 minutes undo a week's work.
- Don't think you're a painter because you have touched up the running gear and fixed up a spoke.
- Don't allow a finished vehicle to remain in the store room for any length of time without washing.
- Don't forget that a small hand bellows or a bicycle pump is very handy in removing water and dust, from evasive corners.

### A Country Smith-Shop of Texas.

EDWIN SATTLER.

The accompanying engraving shows an interior view of my shop. I am situated in a good farming country. My equipment consists of two forges, two Peter Wright anvils, two blowers, two vises, two drill machines, one set of stocks and dies, one tire bolting machine, one 8-foot wooden lathe, two emery stands, one tire bender, one tire upsetter, one shear and many other hand tools for various purposes.

My work consists of shoeing, plow work, wagon and carriage repairing, painting and miscellaneous repairing. I have steady work for two men all the year round.

### Power in the Smith Shop.

J. E. S.

Having had some experience with the gas and gasoline engine in the blacksmith and repair shop, I will endeavor to give some of the reasons why it pays to put in power. I use an 8-horsepower engine, and run seven different machines viz. band saw, buzz planer, tenoning machine, rip saw turning lathe and spoke lathe. I do not run more than three or four of them at a time, as I do not have use for them all at once. I can run the band saw, rip saw and buzz planer at the same time and can run them ten hours for about 70 or 75 cents.

I can do more work with these machines than ten men could, by hand, thereby saving at least \$10.00 for labor. If only running one or two machines, the cost is less. The engine takes about thirty seconds to start. Thus you can have your power just at will, which is not so with steam. I have been running my engine six months and it has never cost me a cent for repairs, and apparently will not for a long time to come.

The gas engine, where a man under ordinary circumstances needs three or four hands, will cut out at least two of them, thereby paying for his power in one year or nearly so. You can do the work much quicker than you could otherwise. When you have power, your customers don't mind bringing their work in, as they know you can do it in short order. You can put in a set of hounds or put on

wants his work the same day he brings it to your shop and it is almost impossible unless you have power of some kind. Where you do not run your machines steadily it would not pay you to "steam up" for a little job. When the gas engine stops expenses stop with it.

### How We Prevented Our Water Tank from Freezing.

A VILLAGE BLACKSMITH.

When we fitted up our gasoline engine and water tank we put globe valves on the inside of the tank on both the bottom and top pipes. We let the pipes extend into the tank about 4 inches and then screwed on the valves. By the aid of round bars of iron attached to the valves we are enabled to close them, then by opening the drain cock on the engine we drain



INTERIOR VIEW OF A TEXAS SMITH SHOP.

a set of wagon rims in less than half the time it takes by hand, thereby enabling you to do at least twice as much work in the same time, especially the woodwork. If you put in a power hammer in connection with the other machines it will enable you to do your forge work much quicker and easier.

The progressive blacksmith cannot afford to be without power and the gas engine is the power for him. It is always ready for use and only requires a small tax for fuel, and does not require any fireman or extra hand to attend the engine. When you use the electric spark there is absolutely no danger of fire. I can start my engine in the morning and it takes care of itself from then to dinner and from dinner to night. I would advise every smith to put in power wherever he possibly can; it will pay him.

It is the best trade drawer you ever saw. In this progressive age a man

the cylinder but do not let any water out of the tank. This method removed the danger from the engine cylinder but left the tank exposed in cold weather, so we proceeded to fix that in the following manner. First we boarded up all around the tank leaving a space of about one foot between tank and boards and let them extend above tank about 8 inches. We filled the space with dry sawdust, placed some thin plank on top of the tank and about 4 inches of dust on top of same. The thermometer has registered 12 below zero since we fixed up in this way, but the water in our tank has never frozen. As we used some old lumber, which we had on hand, the cost did not exceed one dollar.

Even if all new lumber were necessary this arrangement would be well worth the cost. Many enterprising smiths know the advantage of a non-freezing water tank.

### Never Give Up

ANONYMOUS.

Never give up! It is wiser and better  
Always to hope than once to despair.  
Fling off the load of doubt's cankering fetter,  
And break the dark spell of tyrannical  
care.

Never give up! or the burden may sink you.  
Providence kindly has mingled the cup.  
And in all trials or troubles, bethink you,  
The watch-word of life must be, "Never  
give up!"

Never give up! There are chances and  
changes

Helping the hopeful a hundred to one.  
And, through the chaos, high Wisdom  
arranges

Ever success, if you'll only hope on.  
Never give up! for the wisest is boldest,  
Knowing that Providence mingles the  
cup.

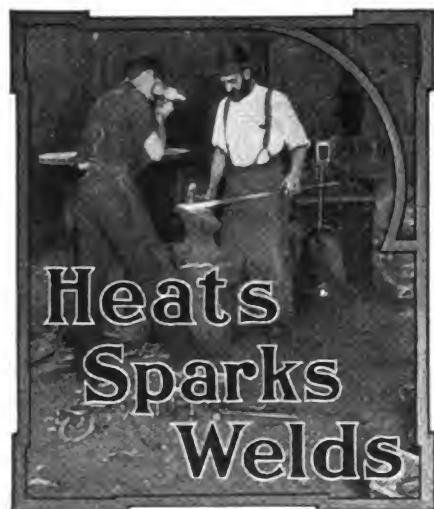
And of all maxims, the best, as the oldest,  
Is the true watch-word of, "Never give  
up."

Never give up! Though the grape-shot  
may rattle.

Or the full thunder-cloud over you burst.  
Stand like a rock, and the storm and the  
battle

Little shall harm you, though doing the  
worst.

Never give up! If adversity presses,  
Providence wisely has mingled the cup.  
And the best counsel, in all your distresses,  
Is the stout watch-word of, "Never  
give up!"



Oil the newly tapped hole before screw-  
ing the bolt in.

Perhaps it's the unnecessary work you  
do that eats up the profits.

The progressive smith leads, not follows,  
his customers. He does it with advertising.

Take particular pains to call your cus-  
tomers by name, especially the new ones.

Examine it frequently—don't allow any  
nuts or bolts to become loose on the gas  
engine.

Trouble in pouring babbitt? Perhaps,  
slightly heating the box will solve the  
question.

Germany, the largest producer of po-  
tatoes, grows as high as 48 million tons  
in one year.

Few indeed are the crafts that depend  
not, in one point or another, upon the  
blacksmith.

Let us have your side of the question,  
if you don't agree with everything said  
in this journal.

"Quality," said Thornton, "makes the  
price, but it takes brains and labor to  
make quality."

Who knows how to use them doesn't  
bear down on the file or hacksaw on the  
backward stroke.

When were the last statements sent  
out? Of course money comes in slow.  
You must go after it.

Your signature at the bottom of an  
order for a gas engine signs your emanci-  
pation from drudgery.

A New York theatre manager is reported  
to have "imported" a French blacksmith  
to sing at his theatre.

Silence is never golden when its your  
turn to speak. But—when you get started,  
remember to stop when finished.

Did you know that farmer Brown had  
just purchased a cultivator? You might  
just as well have sold it to him.

"The passing of the horse," said Tom,  
as a former customer led a shoeless horse  
past the shop to a neighbor smith.

In Queries, Answers, Notes, brother  
Stephenson tells how he treats "his boys."  
Does he have apprentice troubles?

Stop right now and see your neighbor  
about his subscription. Don't lose sight  
of the paper in prospect for next year.

The man who is really busy has always  
time for more. It's the fussy that is too  
busy to even do his accepted task properly.

The shop that tolerates loafers will  
have few customers to tolerate. Draw  
a sharp line between visiting and loafing.

It may run all right without care but  
its reasonable to believe that the gas en-  
gine will run better with proper attention.

Even veterans, who have spent from  
thirty years to half a century beside the  
anvil, admit that they still have much to  
learn.

When your time is up, save money by  
taking advantage of our special long time  
rates. Ask about our rate for a life sub-  
scription.

'Tis said that Portugal is going to pur-  
chase two aerial warships for use in the  
expedition against the revolted tribes of  
West Africa.

It's not at all exceptional for the wife  
to renew his subscription when he's away.  
She knows how he values THE AMERICAN  
BLACKSMITH.

Five cases of broken legs and arms have  
been reported within the past week. And  
still some smiths say that a pair of stocks  
is unnecessary.

Pennies paid in first cost usually save  
dollars in repairs. The cheap machine  
is continually breaking down at an ex-  
pense of time and money.

A good time to install a rubber tiring  
machine is now. In this, as well as other  
things of like character, 'tis well to be the  
first in the neighborhood.

A good horse-shoer and smith is wanted  
at Louisville Georgia. Interested parties  
should write to Mr. W. T. Gibbs at that  
place.

Water, sand and puncture proof is a  
recently invented leather pneumatic au-

tomobile tire. The new tire will be handled  
by a Detroit firm.

Its pretty poor stuff that has not one  
good point—its, "Which has the most  
good points?" that the buyer and em-  
ployer must decide.

Give us your ideas, Master Apprentice.  
The boss has had his say, now tell what  
you think of the apprentice question.  
There are always two sides.

Within the past few years the manu-  
facture of steel has made over fifty mil-  
lionaires and its use has been multiplied  
many times. Truly, steel is king.

Don't let up on your advertising when  
the plowing begins, when the farmer is  
just beginning to realize his needs. Tell  
him what you have to offer at this time.

Treat your customers as though you  
wanted their trade for all time. You  
are in business to stay and every satisfied  
customer is a stone in the foundation of  
future business.

There is nothing like it for increasing  
trade—it will go almost as far as the quality  
of the work. Again we say, there is noth-  
ing like a bright, cheerful and smiling  
face for winning trade.

The cost system of a large factory is  
just as important as any other depart-  
ment. How do you regard your costing?  
Your time, rent or taxes, coal, light, fuel,  
repairs and tool fund all enter into the  
cost of production.

The successful use by a large English  
engineering firm of a suction gas producer  
and gas engine as motive power for a  
small yacht is reported. For a small  
yacht it was stated that 1 horsepower  
per hour could be produced by 1 pound  
of anthracite, and it is claimed that suffi-  
cient fuel can be carried on board the barge  
for more than a day's run. In the case  
of the yacht the gas producer and engine  
were said to occupy only 12 feet 6 inches  
by 9 feet 4 inches floor space, with 6 feet  
8 inches for headroom, the hopper carrying  
enough fuel for a ten-hour run at from  
10 to 12 miles per hour. 'Tis stated that  
Messrs. Beardmore & Co., of Glasgow,  
had contracted to install a suction producer  
and engine giving 600 horsepower in the  
Earl, a three-masted schooner 136 feet  
long by 23 feet beam and drawing 11½  
feet of water.

Next in importance to the increased  
use of waste blast-furnace gases—of which  
the largest installation is at the Lacka-  
wanna Steel Company works, near Buffalo,  
where there are, ten 2,000 horsepower  
Koerting gas engines, built by the Dela-  
vergne Engineering Company, of New  
York—and waste coke-oven gases, is  
the development for power purposes of  
gas producers and suction gas producers.  
So rapidly has gas producer practice come  
to the front it has warranted the publica-  
tion, and profitably, of both an American  
and English edition of a periodical which  
pays special attention to the subject,  
and the increasing use of gas producers  
for factories is causing anxiety to gas  
companies. The fact therefore that the  
practicability of using producers and gas  
engines with economy in cost of fuel and  
economy in room in boats, is being dem-  
onstrated, is exceedingly important.



### The American Association of Blacksmiths and Horse-Shoers.

The past three months have seen the formation and organization of a number of county branches. And, while the number was not as large as we would like it, we are satisfied that our continued hammering is resulting in some good work. Of course, organizations cannot be formed all over the country at one time. We must come to it gradually. A reform movement if taken up too quickly is usually dropped quickly. We of the American Association are building for all time and the foundation must be solid through and through. What we want for the foundation is, good healthy growing county associations; associations that we can rely upon for support; branches made-up of live, shop-owners, progressive craftsmen and up-to-date smiths.

The reason that more rapid progress has not been made in the formation of branch associations is because the smith fears that his neighbor will be unwilling to co-operate with him. But what is worth anything is worth trying for and organization is certainly well worth the trouble of visiting the neighborhood shops and convincing your neighbor smiths of the value of an association. Of course the greatest benefits result when every craftsman in the county is a member of the organization, but because a few smiths are blind to the benefits of an association is no reason for your hesitation. Just get the other smiths solidly organized and it will not be long before these smiths will see by the various reforms, benefits and the changes in local conditions, that membership in the association is an unlimited benefit. Now, why not lend your aid? We want your help and you want ours, therefore why not get in touch with us now? Just drop us a note telling us that we can count on your help. Will you write now? Remember to address, The American Association of Blacksmiths and Horseshoers, P. O. Box, 974, Buffalo, N. Y.

### The Other Side of the Question

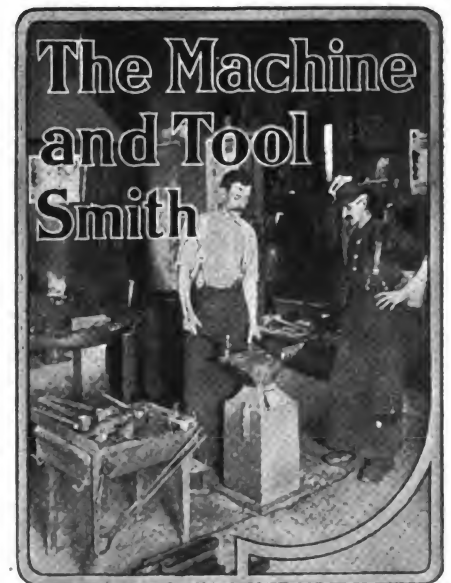
W. A. PALMER.

In the April issue appeared several complaints about the "other fellow," poor workmen, unfair catalogue houses, price cutting etc. Now, who is to blame? Are those smiths who growl about poor workmen and price cutters wholly in the right. Are they able to furnish as good an article for the

same or less price? One of them seems to think that a person ought to be willing to help keep up an establishment simply because the proprietor wants to live. My dear sir, you fool yourself. The catalogue house and department house are here to stay, and so also are poor workmen or at least until they become better by reading and practice.

If your section of the country is overstocked with shops, just do as the writer had to do. Some years ago I had a small shop in the east, and was doing as well as the common run of smiths. But I had time to think and growl, and I always growled at the other fellow. So I finally decided to change. Now if you are of the right temperament, and can enjoy sport at your own expense, just quit your small shop and go to work in a large factory where they do things. You will be surprised at your limited knowledge of blacksmithing. You will see that there are many things that you ought to know more about. For an illustration of what I mean, I will tell you of a case in point. The foreman sent to a new hand, 20 sets of axles to be set, and along with the axles these instructions. "Set the 10 sets of 2-inches axles for a  $\frac{7}{8}$ -inch dish, and the 10 sets of  $1\frac{1}{4}$ -inch axles for  $\frac{3}{8}$ -inch dish." The next day he sent the same man a bunch of axles to weld, some with 9-inch arm, some 10-inch and some 12-inch and all 9-inch and 10-inch arms for 4 ft. 6-inch track and the 12-inch arm axles for 5 foot track. Could you do it and hold your job? And now really before you growl are you a good workman? I take THE AMERICAN BLACKSMITH to get information as there will something come up every day, that I ought to know more about, and only by study and practice can I make good. I would like to suggest to the reader a few subjects that we might thrash out to our mutual benefit. I would like to know why we set an axle, the real reason, and how to set same properly. Now cover the ground thoroughly enough so that it will fit all cases. There must be only one taper to a skein or axle that is right. Let's know what the taper should be. Foolish, did you say? Think it over before you commit yourself. Dish of wheels; let's have a four column article on this subject. You can't tell it all in four times four columns. Cold tire setting is another matter that we are all interested in. It is a subject that demands careful thought

and lots of study. I have heard very strong words used against these machines as well as words in their favor, and there are plenty more subjects to write up that we are all very much interested in. If any of you can throw light on any smithing matters let your light shine through the columns of THE AMERICAN BLACKSMITH, as they are always open to you. We can all cut out the tinker business with profit and use the time in study. This is an age of concentration and specializing, and specialists are only made by study not of one subject but of many. One must know many things, be able to think along correct lines, and must be able to theorize and carry out his theory to final success by the aid of study. Whether you are a success or not, will be determined not by a growl at the department stores, poor workmen, etc., but by the fact of your ability to run a department store. The twentieth century way to spell success is work and study.



### Hardening and Tempering Steel-8.

E. R. MARKHAM.

Almost every school boy who has reached the age of fourteen knows that steel when heated red hot and plunged in water, or some other liquid becomes hard: And it seems strange that a process that is familiar to so many should be but little understood, that is, so far as satisfactory results are concerned.

When steel is heated red hot it is expanded to a considerable degree. When cooled it contracts. Now when a piece of red hot steel, which is ex-

panded is plunged into the water, or other cooling medium, the contraction is very sudden. A piece of steel heated to a temperature of 1300 degrees F. and plunged in a cooling bath is suddenly cooled to a temperature of from 40-60 degrees F. The more rapid the operation of cooling the harder the steel. Knowing this, the operator who has a wide range of work to harden has various baths each one being specially adapted to a certain class of work.

Steel heated to a red and plunged in a bath of mercury is harder than if quenched in almost any other cooling medium: but mercury is too costly to use for this purpose, and consequently is but little used except in the hardening of drills and other tools used in cutting chilled plates.

Clear water is the medium used most extensively but, for many pur-

than any thing else; and it may be so for his particular purpose.

In addition to salt, some smiths add 4 ounces of cyanide of potassium to every gallon of water. This is accomplished by heating the water to the boiling point then adding the cyanide which has been pulverized; the salt may be added when the liquid has cooled.

A very effective bath for small articles is made by dissolving one pound of citric acid (crystals) in one gallon of water. By using these proportions a bath of any size may be made. The following bath I have found in the shops of a number of very successful smiths. To 3 gallons of rain water, add 4 handfuls of table salt and 2 ounces of corrosive sublimate. A bath used by a number of hardeners with whom I am acquainted is made by adding in various proportions sul-

of articles of the forms of tools commonly used. It should be borne in mind, that baths containing cyanide of potassium, corrosive sublimate, or sulphuric acid have deadly effects if taken into the system, and for this reason should never be left where any one may get hold of them by accident.

For small, or thin articles, a bath of oil is often found to give as good, if not better results than water, as it causes sufficient hardness, without springing or cracking the piece. At times clear oil does not give as good results as may be obtained by the addition of certain elements. For hardening small or thin cutting tools a bath of *raw* linseed oil works well, while for springs, sperm oil, or tallow gives good results. For heavy pieces, lard oil works nicely and is used in many shops for hardening locomotive springs. When clear oil fails to work satisfactorily an addition of 3 to 5 per cent. of resin will at times make it work nicely, although too much resin in the oil appears to have a bad effect on steel. At times a small amount of alum added to oil increases its effectiveness, at other times beeswax, or rendered beef suet added in small quantities will prove beneficial. Some hardeners use turpentine in the hardening oil; but, several cases of severe burning have led me to be careful, and although it works well, I do not advocate its use.

For hardening heavy pieces having light projections, a bath of water having one or two inches of oil on the surface gives good results. Such a bath is shown in Fig. 1 the heated steel passing through the oil first is not attacked so quickly by the water as would be the case if it had not passed through the oil, and the contraction of the light portions is not so rapid as would otherwise be the case. Fig. 2 shows a bath used in shops where it is desirable to cool the work a certain amount in water and then pass it into oil without exposing it to the air. The tank, as will be noticed has a partition running down part way on one side and thus keeps the oil from mixing with the water. The work can be immersed in the water, left in it the desired time and then passed under the partition and up into the oil as shown, and left there to cool.

Of course the particular form of bath must be determined by the character of the piece, and the desired condition of the piece. Many times a still bath will not give good result, in such cases the contents must be agitated; this

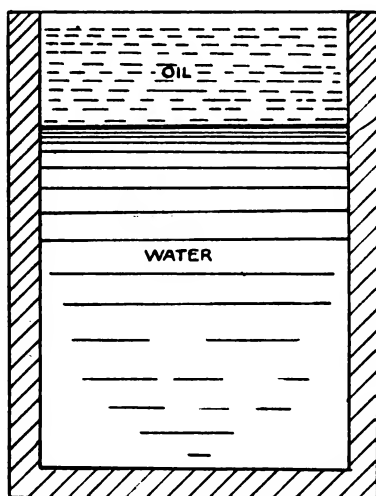


FIG. 1.—A WATER BATH WITH TWO INCHES OF OIL ON SURFACE.

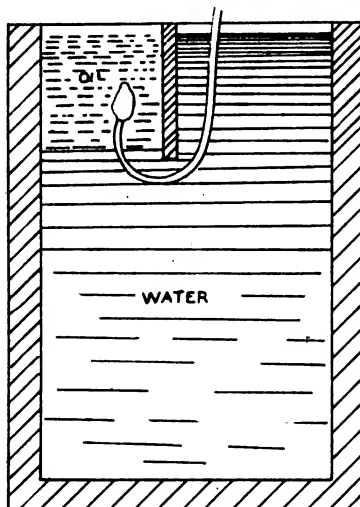


FIG. 2.—WATER BATH WITH OIL ON ONLY PART OF SURFACE.

poses it does not answer as well as when certain elements are added to it. Brine, made by dissolving all the salt possible in the desired amount of water is a common medium and a very satisfactory one. If *clear* water is used, soft water will be found more satisfactory than hard; for this reason many hardeners use rain water. Water that has been used for some time, unless it contains dirt, or grease is found to work better than fresh water. The same result may be obtained if fresh water is boiled and allowed to cool, then used. When testing steel about which there is any question I generally use rain water that has been boiled. Almost every hardener who has had a long experience has some favorite compound that he considers a better

phuric acid to water, some using one tenth—by measure—of acid, others using as much as one half acid. Experience however has convinced me that a bath containing any acid that will attack steel, is highly injurious to the steel. The injurious effects may not be apparent at the time of hardening but they will manifest themselves later on, appearing to "rot" the steel.

The following is used by the writer with excellent results, where small pieces of irregular shapes are to be hardened. Salt, 2 teacupfuls; pulverized alum, 2 teaspoonfuls; saltpetre 1 ounce, rain water 2 gallons. There are many other preparations I might give but the above will be found to cover the needs of most hardeners

is accomplished by a method adapted to the desired result. At times it is accomplished by having a delivery pipe coming up from the bottom as shown in Fig. 3. At other times the pipes shown in Fig. 4, are used together with the jet from bottom as shown. The particular advantage of this form of bath consists in being able to project a number of small streams of liquid from each of the pipes against the sides of the work. If we are to harden pieces like lathe mandrels, where the ends must be hard, a stream of liquid may be delivered from above onto the top of the bath also. The reason that baths must in many cases be agitated is that steam forms around the piece of steel from contact of the red hot steel and water, the agitated bath forces the steam away from the steel and allows the water to come in contact with it. As a rule steam will not remain equally around a piece of steel, but will form "pockets," thus exposing a portion of the steel to the water, and keeping it away from the balance thus causing *hard spots*, or rather resulting in soft spots as we usually term them. Water cannot rapidly absorb heat from steel unless it comes in direct contact with it; thus the necessity of some form of bath that does not allow the steam to keep the contents away from the steel.

A very common cause of trouble is uneven heating of steel; if steel is unevenly heated then the contraction is also uneven, and it is very liable to crack. In order to avoid uneven heating, the operator at times will heat too *slowly*, thus weakening the steel. Steel that is allowed to "soak" in the fire is not as strong as if heated as rapidly as is consistent with even heats. Rapid heating is of course a relative expression, because a piece of steel with delicate projections would be injured if heated as rapidly as would be the case with a solid piece of the same size. Nevertheless steel should be heated as rapidly as is possible and not overheat any portion of it.

Overheating steel *must* be avoided, as every degree of heat received above the refining heat injures it and the steel is rendered unfit for use in proportion to the degree of overheat. And again, high heats cause steel to crack in the direction of the length of the bar. Extremely *cold* baths should be avoided as they strain the steel. In fact I do not think it best to use cold baths for most work: there

are few pieces that cannot be hardened as effectually and with better results if luke warm, and in many cases warm baths have to be employed. Where delicate pieces are being hardened in large quantities it is customary to have a supply tank overhead, the overflow from the bath being pumped to the supply tank, and the liquid then run to the bath. The contents of the bath may be warmed by a steam pipe to any desired temperature, and if exact uniformity of product is essential the temperature of the bath must be kept very near a certain temperature. This may be ascertained by means of a thermometer. However in the majority of cases such a measure is not necessary as the skilled operator is able to accurately gauge the temperature by the sense of feeling.

Experience has taught me that too few hardeners realize the importance of extreme care when hardening steel. They seem to think that because they have succeeded in making the outside of the steel so hard it can not be filed, they have fulfilled their

or the cutting edge will crumble away. This may be remedied somewhat, by drawing the temper more than would otherwise be the case, As a result the tool will be softer than it should be, and will need grinding oftener than if heated to the proper temperature.

The refining heat of a piece of steel is the temperature to which it should be heated for hardening, as this heat leaves it the strongest possible, and best adapted to perform any work it may be called to do.

(To be continued.)

### A Short Talk on Machine Steel.

DATTON O. SHAW.

In a repair shop there is occasionally a call for a special tool. Some time ago we had to make a  $1\frac{1}{2}$ -inch tap. We had no tool steel large enough to make it, so a piece of machine steel was cut from a 2-inch bar. The tap was made and then it was placed on end in a 3-inch gas pipe. In the bottom of the pipe was packed  $\frac{1}{2}$ -inch of pow-

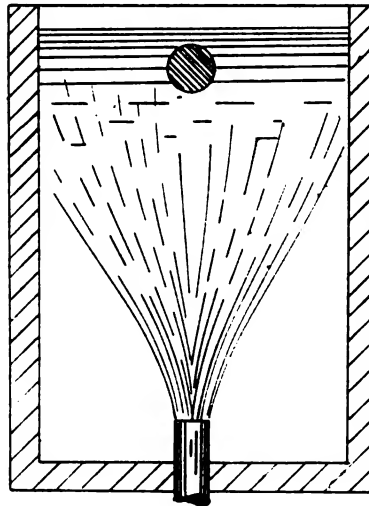


FIG. 3.—WATER BATH WITH DISCHARGE PIPE AT BOTTOM.

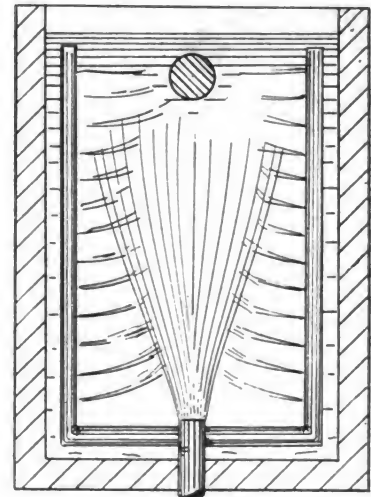


FIG. 4.—WATER BATH WITH DISCHARGE PIPE AND SIDE JETS.

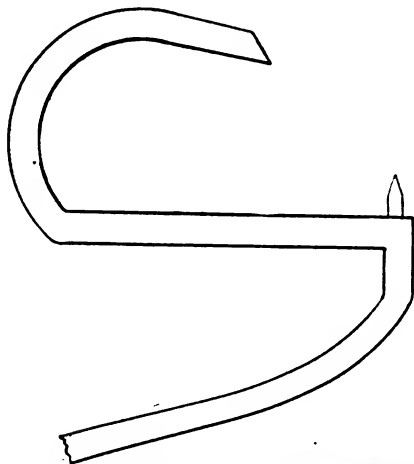
mission. The outside of steel may sometimes be hardened so it resists the file and yet not be hardened deep enough to resist the pressure incident to cutting iron or steel and as a consequence it would cave in where used.

Steel that is overheated is coarse in structure, and if broken the fracture has the appearance of cast iron. Such steel will be found weak just in proportion to the amount of heat it has received. Overheated steel is extremely brittle and if tools are subjected to this treatment they will not stand under strain, but will break,

dered charcoal, a thin layer of charred leather and a sprinkling of prussiate of potash. The tool was placed in the center of the pipe. This carbon material was packed and pressed down around the tool until the cutting part was covered. Then the pipe was filled up with charcoal 2-inches above the shank. It was now placed end up in the fire and heated to a red: It was then kept covered with charcoal and kept hot by radiation. It was kept in this state for three hours; then hardened in brine, and after hardening, boiled in water for 20.

minutes. This tool gave good satisfaction.

I treated a large milling cutter in the same way with good results. Now, I cannot say how long the tools would wear, but they did the work required of them. The spindles for automobile



A BOLT HOLDER FOR THE PLOW WORKMAN

axles are treated in a similar way. The carbon is worked into a certain depth and then the work is taken from the furnace and hardened. The outside is hard as glass, while the inside of the spindle is soft. This makes a hard-wearing surface and the hardened part is supported by the soft part which makes it very strong and durable.

In hardening auto cones I have noticed that some of them take water very slowly and on this account, have to be heated hotter to get them hard. To overcome this high heat, I sprinkle prussiate of potash in the groove where the ball bearings are, being careful not to get any on the thin flange. This is put on when the cone gets to a low red, then heat the same as for tool steel. The potash will cause the steel to take water quickly.

#### A Bolt Holder for the Plow Workman.

W. D. BOETTLE.

The accompanying engraving shows a very hard plow bolt-holder which I have found especially useful in plow time. Any handy smith can make one in a very short time out of some old  $\frac{1}{2}$  or 1-inch buggy axle. It saves lots of time with round headed bolts. The chisel point is inserted in the tool with a square shank and hole. The edge of this point is  $\frac{1}{2}$ -inch wide and should always be kept sharp. The lever or handle can be about 30 inches long. The distance from chisel point to center of bow should be  $5\frac{1}{2}$

inches. The distance from the bevel end of the tool down to the horizontal piece running from chisel point should be 2-inches. This explanation, with the engraving should enable every craftsman to make a good serviceable plow bolt-holder in very little time.

#### A Handy Combination Wrench.

A. GAUVAIN.

The accompanying illustration shows a very handy wrench which will be found very helpful in most every shop. This wrench is easily made and will be found of use on tire bolts, gear bolts besides having a small socket at one end.

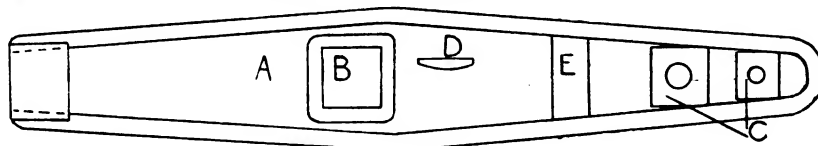
To make the wrench, take an old horse-rake tooth and swedge half oval as D. Now measure off about sixteen inches of stock and bend it in the center, welding a piece of  $\frac{1}{4}$ -inch square mild steel or Norway iron to the free ends to form the socket wrench at F. After thoroughly welding this piece in, drill a hole in the center and after taking a good heat, work it out square to the desired size, tapering the hole so as to prevent the nuts from sticking. The end view of the socket wrench is shown at B. To keep the wrench from spreading apart, a rivet and wedge are used as at E. This holds the sides of the wrench rigidly and allows nuts at C, to be held firmly.

#### A Sectional View of a Sound Foot.

Several engravings, showing sections of the horse's foot, have already appeared in these columns, but it is our opinion that too much matter of this character cannot be published. The

bone, the navicular bone and the coffin bone. These bones are united in such a manner as to form a joint, the navicular joint. At the upper and back portion of the coffin bone and on each side are the lateral cartilages, half-moon shaped pieces of gristle extending upwards above the wall, and backwards towards the heels. Occupying the entire space behind and between the wings of the coffin bone is the plantar cushion. This structure acts much as does a rubber heel on a shoe. Over all is drawn a specialized skin, covering all of the parts much as a sock covers the foot. This skin, according to the character of the horn which it secretes, may be divided into five regions, the periople, which secretes the thin varnish-like layer covering the outer surface of the wall; the coronary band, which secretes the middle layer of the wall; the sensitive laminae, which secrete the inner layer of the wall and bind the wall to the foot; the sensitive sole, which secretes the horny sole; and the sensitive frog, which secretes the horny frog. In addition, the foot is richly supplied with blood vessels and nerves.

Even slight injuries to the foot, on account of the character of the offending body as well as to the fact that the foot is constantly in contact with dirt and filth, are almost universally accompanied by pus formation. The pus being imprisoned by the firm horn, presses upon the sensitive structures within, causing exquisite pain, and lacking free outlet, it burrows its way under the horn, separating it from the skin which secretes it, i. e., the horn becomes "under-run." The character of the lameness thus produced



A VERY HANDY COMBINATION WRENCH.

engraving shown this month gives very clearly and concisely the various divisions of the foot with their location. The practical shoer will see at a glance the value of this chart and it is unnecessary to comment further upon it.

#### The Treatment of Nail-Pricks.

E. L. MOORE, VETERINARIAN, DAK. COLLEGE OF AGRICULTURE.

Briefly reviewing the anatomy of the foot, it will be found to consist of a framework made up of three bones: the lower portion of the short pastern

varies somewhat with the portion of the foot which is affected. In general there is a tendency to favor the foot in standing, and as the foot is brought to the ground in walking or trotting the horse distinctly avoids bringing weight to bear upon the wounded portion. A careful examination of the foot with the hand, the hoof-testers and the hoof-knife verifies the suspicion.

The method of treating these cases is as follows: A twitch is placed on the horse's nose, the foot is then thoroughly

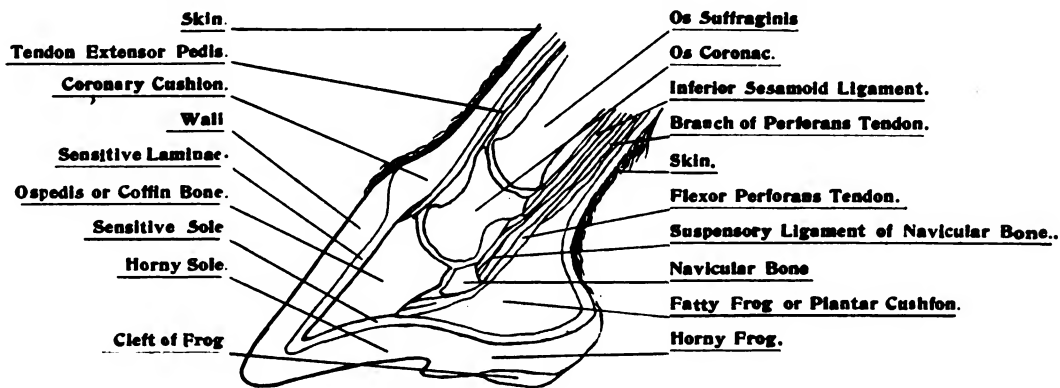


cleansed with soap and water, after which the horn is freely cut away from around the affected point until by the oozing of blood it is positive that all under-run portions of the horn have been removed. The foot is now washed in a solution of mercuric bichloride 1-500, a piece of absorbent cotton is saturated in a solution of the same strength and applied so as to cover the wound; another piece of cotton of sufficient size to cover the entire foot is then soaked in the same solution

another dressing of iodoform and tannic acid may be made if necessary. As a rule, however, little need be done at this time except to provide some protection to the newly forming horn. This may be accomplished by means of a leather sole placed underneath the shoe.

The keynote of success in following this method of treatment lies in the complete removal of all portions of horn that have become under-run with pus, and the thorough cleansing and

an unimportant injury. A mare sustained a nail prick of the frog, involving the underlying sensitive structures. No attention was paid to the case until the pain had become so exquisite that she was unable to bear any weight upon the affected leg. Examination showed that the frog had become under-run with pus and that the region of the fetlock was very badly swollen. On removing the frog a relatively large amount of pus escaped. The foot was trimmed out, cleansed and



A SECTIONAL VIEW OF A SOUND FOOT.

and firmly bandaged over the foot, allowing a part of the cotton to extend above the bandage; a thick coating of tar is then applied over all. The tar serves to retain the bandage in place, and, of more importance, prevents any germ-laden dirt or moisture from reaching the wound. On account of the cotton extending above the bandage it is an easy matter to pour a 1-500 solution of bichloride of mercury into the top of the bandage and rely upon its reaching the entire foot. Frequently this daily application of bichloride (1-500) is made by means of a rubber bulb syringe, the end of which is introduced between the cotton and the foot. This dressing is to be left in place for from seven to ten days without being disturbed. Unless complications arise, such as swelling above the bandage, the longer time is to be preferred. At the end of this time the dressing is to be removed, and if any pus is still present the bandage is to be applied as before; otherwise the foot is now washed with a 1-500 bichloride solution, thoroughly dried, and then dusted with a powder consisting of equal parts of iodoform and tannic acid.

The same powder is freely applied to a large piece of cotton and the foot again bandaged and coated with tar. The foot is now left undisturbed for two weeks. At the end of this time

asepsis of the foot.

The following cases are described as illustrative of this method of procedure, and show what may fairly be expected in the way of results.

Case A—A large gelding, which had the history of going lame suddenly on the right hind leg, and was unable to bear weight upon the same. There was also considerable swelling above the hoof, extending upward as far as the fetlock joint. Subsequent examination showed that all of the frog and fully half of the outer portion of the sole was under-run with pus. All such portions were completely removed and the foot bandaged in a bichloride solution as described. The owner was directed to pour some sublimate solution into the top of the bandage twice daily. In a week this bandage was removed, the foot again washed in a sublimate solution, thoroughly dried and dressed with a powder consisting of equal parts of iodoform and tannic acid. This bandage was left in position for ten days, and as at the end of this time new horn had formed to replace that which had been removed, he was taken to the farrier's and a shoe applied with a false sole of heavy leather underneath it. The horse was now allowed to resume his work of plowing.

Case B—This case is reported in order to show what untoward results may follow what is too often considered

bandaged in a bichloride solution, the application of tar, however, being omitted. The owner was directed to give notification if any further attention seemed necessary. Evidently not being satisfied with the way the foot was doing, and probably largely influenced by outside opinions, the owner had the bandage removed and a cow-manure poultice applied to the entire foot. Within a few days after this a telephone message was received to come immediately, as the horse was very much worse. The symptoms showed a well developed case of tetanus or lock-jaw, from which the horse died in two days. Tetanus is not frequent in this locality, and the clinical history would seem to support the theory that the wound was inoculated with tetanus bacilli contained in the dirt and filth of the cow-manure poultice. This furnishes one reason, and a strong one, for absolutely condemning the use of such a poultice.

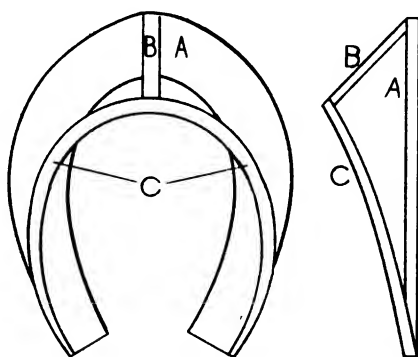
Case C—An incomplete history prevented accurate knowledge being obtained as to the nature of the injury in this case. The horse had been lame, but subsequently had made sufficient recovery to permit of his being again put to work. The owner had made an examination of the foot, but had been unable to detect anything wrong. The horse had been used for hauling grain to town on a Saturday, and ac-

cording to report went but slightly lame. Later he became excessively lame, being unable to bear any weight on his leg. He was loaded on a wagon and brought to the hospital on the following Tuesday. It was found that the foot had suffered an injury and that the entire sole and frog had become under-run with pus. After placing the horse upon the operating table the foot was thoroughly washed with soap and water and all of the horn covering the bottom of the foot was removed. After being cleansed in a 1-500 solution of bichloride of mercury, the foot was bandaged and coated with tar. He was then removed to the hospital, and after-treatment consisted solely in the daily application of a bichloride solution at the top of the bandage. In ten days the bandage was removed and the foot dressed with equal parts of tannic acid and iodoform and the patient discharged. He was seen again in two weeks, when it was found that for the most part new horn had formed over the bottom of the foot, the only exception being at the buttresses, where there was a slight amount of pus. The foot was dressed with powder as before, and from this on recovery was quick and uneventful.

Case D—A driving mare suffered from a nail prick of the frog, and received no further treatment than the application of a cow-manure poultice. At the time she was placed under our care the wound produced by the nail was suppurating, and the pus had worked its way upward, discharging by an opening in the hollow of the heel, and another about two inches above this on the posterior aspect of the pastern. The frog and both wings of the sole were removed, and then an incision was made passing from the uppermost opening to the cleft of the frog. Into this was firmly pressed a piece of cotton soaked in the usual strength of sublimate, and cotton and bandage applied as in other cases. By means of a syringe a 1-500 solution of sublimate was introduced at the top of the bandage twice daily. In addition the mare was placed on dram doses of calcium sulfid twice daily, as there was some fever. In a week the bandage was removed, when it was found that the wound presented a perfectly healthy appearance. A sublimate bandage was again applied and left in position for another week. The foot was then dressed in the usual powder, the application of which was repeated twice.

The wound made complete recovery, although the mare remained lame for a considerable time thereafter.

Case E—This horse was used on a delivery wagon, and stepping on a piece of glass, sustained a transverse cut across the frog, penetrating the fleshy frog. A poultice had been applied as in the preceding case. Later the owner made some attempt at asepsis by bandaging the foot in a bichloride solution, but since no provision had been made for the escape of pus by cutting away the frog around the edges of the wound, consequently there was no improvement in the case, as the pus continued to burrow between the horny and the sensitive frogs. Treatment in no respect differed from the methods already described,



A SPECIAL SHOE FOR SPECIAL CASES.

and recovery was both rapid and satisfactory.

Case F—A two-year-old stallion was reported lame from thrush. On seeing the patient, he was found standing, resting the right hind leg with the foot flexed. Not having any instruments, the foot was simply picked up, inspected and palpated with the hand. There was every evidence of thrush, and the diagnosis seemed to be sustained, since there was marked pain on pressure over the base of the frog. The owner was directed to treat for thrush. In about a week word was received that the colt was not doing well. At this time he was unable to bear any weight on the leg, and there was some swelling around the pastern and fetlock. Previous to this a farrier had been called to examine the foot, but had been unable to detect anything wrong with it. The bottom of the foot was pared with the hoof-knife, but in spite of the most diligent search no trace could be found of any injury. Examination of the rest of the leg failed to reveal any cause for the lameness. Recalling the adage

previously quoted with reference to the necessity of a thorough inspection of the foot in all cases of lameness, it was again subjected to the hoof-knife, since the hoof-testers failed to reveal any sore point. After again paring the sole a place was found which yielded more than normally to pressure. A little more paring with the knife and pus escaped. From this on it was a simple proposition and differed in no respect from the cases already cited. All under-run horn was removed, the foot cleansed, bandaged and coated with tar. Recovery occurred so satisfactorily that the patient was not seen again. This case especially illustrates how readily one pathological condition of the foot may interfere with the recognition of a second, should the latter be not so self-evident.

To this record of cases could be added several more of a similar nature, but they would be but a repetition of the preceding. Sufficient have been cited to show how dire may be the results if such injuries are neglected or treated in a manner that departs one iota from the principles of asepsis; and how such injuries to parts naturally subjected to infection can be treated satisfactorily and with a minimum amount of attention.

### A Special Shoe for Special Cases.

T. E. PHIFER.

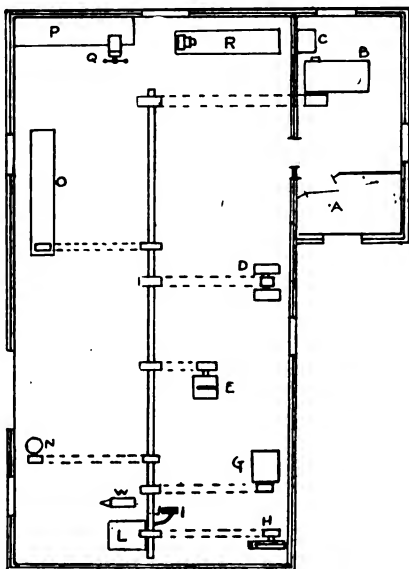
The accompanying engraving shows a shoe for use when the wall of the foot is in such condition as to make it impossible to hold the shoe with nails. It is also useful in curing cracked hoofs and wire cut feet. The shoe is made as follows: Take a regular shoe A, and attach a spring B to it by means of bolts at the heels of the shoe and a short rod C at the toe. The rod or bar at the toe is made any length suitable for the case in hand. The spring is fastened at the heels by means of stove bolts.

### A Few Ideas on Horseshoeing.

F. M. PEDDYCOART.

A very bad forger had me pretty well puzzled. I will try to tell as near as I can, how he travels and how I shoe him. He travels with his right hind foot between his front feet, and when he picks up his left front foot, he hits his right hind ankle. The first one I have ever found to travel this way. I am shoeing him in front

with a shoe that weighs 14 ounces with bars welded across it. This seems to help him quite a bit. He is a fast mover, a track horse, but I am using him myself for a driving horse—Sec nd, I shoe him behind with a 12. ounce side weight, made with a long heel on weight side to make him go wide behind. When he goes his best, he travels very well but when he slackens up he is afraid of hitting himself and stops very quickly. I shoe him with the bow in front to make him



A WELL-ARRANGED NORTH DAKOTA SHOP.

pick up quicker and get away. I leave his front foot about normal length, that is, not very long on the toe, so he can get over his toe before his hind foot comes in contact with it. I leave his toe a little longer behind to slack the reach, and use the side weights to make him go wider behind so as to go on the outside instead of the inside. I have tried a square toe weight in front, but it made him worse.

I see that Brother Walsh has a bad forger. I do not know if my advice will help him any, but I will try to explain my best results with a forger that strikes the center of the foot. I trim the front foot just normal length and then take a piece of bar and turn a shoe to make him break over quicker, so that he will have the front foot out of the way when the hind foot gets there. Then behind, I trim the foot and leave the foot as long as I dare, and shoe him with a side weight shoe having a toe calk a very little higher than the heel calk to decrease the motion. I find that this works in almost every case of this kind that I tried.

### Plan of a North Dakota Shop.

MICHAEL LESMEISTER.

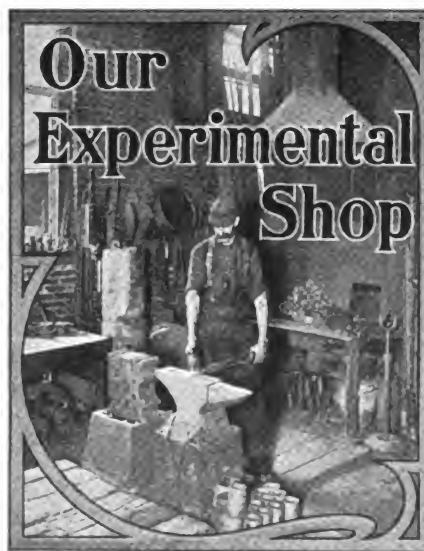
The accompanying engraving shows the plan of my shop, at Harvey, N. Dakota. The engine used is a five-horsepower Waterloo. (Waterloo Gas & Gasoline Engine Co., Waterloo, Iowa.)

I have been in the blacksmith business for 25 years, in Europe, and for 6 years in this country.

The following are the machines in my shop:

A represents the office; B, a five horsepower gasoline engine; C, dynamo and battery box; D, a home-made circular saw table; F, tire shrinker; G, a home-made power hammer; H, power blower; I, hand blower; L, brick forge; M, anvil; N, drill press; O, Iron turning lathe; P, work bench; Q vise; R, home-made wood turning lathe;

We purchased our gas engine from a man who could not repair it. He was running a large machine shop with it but he said it could not be fixed. We paid him \$25.00 for it, painted it up and got a new pump system. The engine now works like a watch. The whole apparatus and new repairs came to about \$50.00, and that's cheap for a five-horse power engine. The engine we have, will run all our machinery at once with perfect ease. We repair all kinds of machinery, such as dynamos engines, etc.

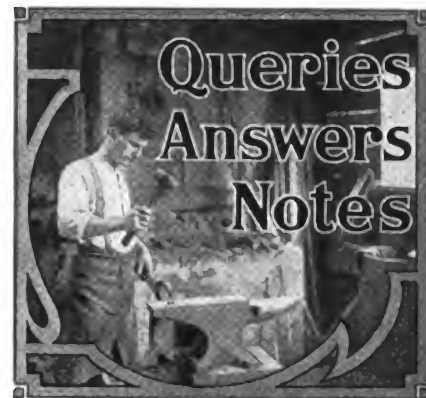


Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

A young Kansas smith sends in the following practical method for sharpening drills correctly. Take a hickory block 2 inches wide, 3 inches high and as long as convenient and bore several holes in it at

an angle of 15 degrees. These holes should be of a size to fit the various drills to be sharpened. Now place the drill to be ground, in the proper hole and grind both sides to the center. By twisting the drill a little to the right of the center you can give it plenty of dip.

Those interested in ornamental iron work will gladly welcome a hint for decorating their work with brass or copper. Thoroughly clean that part of the piece to be decorated—removing all grease, dirt dust and foreign matter—and then plunge into the melted metal. The coating thus produced can be polished like solid brass or copper. By this means andirons, candle sticks and all ornamental work can be given little touches of color which will aid in bringing out the beauties of the work.



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**To Set a Plow Beam.**—I would like to have some older and experienced brother tell me how to set a plow beam of either wood or iron. C. R. ELLIS.

**A Case of Stifle.**—Will some Brother Smith of experience, kindly tell me, through THE AMERICAN BLACKSMITH how to shoe a horse for stifle lameness? I have a case of this kind. J. W. SIMMONS.

**Curing a Knee-Knocker.**—I would like the opinion of some of the craft, through the columns of THE AMERICAN BLACKSMITH, as to the best method of shoeing a knee-knocker so as to prevent interfering. What are your ideas? F. B. SHELDON.

**Welding Heavy Tires.**—Could someone tell me how they weld tires in the factories where they make iron wheels? The tires run from 6 to 10 inches across the face and are from  $\frac{1}{2}$  to  $\frac{3}{4}$  of an inch thick. Can some smith reader tell? JOHN BRAYLEY.

**To Temper a Plow-lay.**—I would like to know how to temper a plow-lay and what kind of a polishing wheel to use. I have power in my shop, and an emery wheel, but I can't give a very good polish with it. A. H. BLUM.

**Best Steel for Disc Sharpener Knives.**—Would like to ask through your valuable journal, if some smith will tell me what kind of steel is best to make disc sharpener knives. How are the knives tempered? L. F. STILLIANS

**A Handy Anvil Tool.**—This tool I have used for cutting rivets, forgings and the like when I had quite a number to cut. Any one can see how it is used. I have cut off over 300 pieces in this manner and if I had not had the tool, it would have taken me considerably longer. It also makes a nice square cut for rivets or anything of the kind and they are not hard to hold.

W. H. NORRIS

**A Trio of Questions.**—How could you weld an axle broken off square in the collar, and have it the same length?

Can you tell me why toe calks don't weld? I use plenty of borax, and blister steel but sometimes, have difficulty in getting them welded.

I would like to know how to temper a draw knife. Is it tempered before the handles are turned, or afterwards? Can some brother help me? I. VAN TASSEL.

**Making the Back Numbers Valuable.**—Very often we run up against a job that puzzles us not a little—we scratch our head, then a smile lights up our face and we remember that Brother so and so had a job exactly like it and gave his experiences in one of the recent issues. So we take down our back numbers of THE AMERICAN BLACKSMITH and find the desired information. The battle is half over when we know just what to do. J. N. NEVILLS.

**A Case of Drop Sole.**—In the February number of THE AMERICAN BLACKSMITH—Brother Sawyers explains a case of what I call drop sole. I have had two such cases in my time, and this is the way I shod them. I took a common shoe and welded a piece of band iron across it, and shaped it to the foot. I then took a piece of felt and made a pad for the foot and nailed the shoe on so there was some pressure on the sole. Change the shoe often and increase pressure each time, and in less time than Brother S. has been shoeing the foot, it will be back in proper shape again.

R. F. ALLGEIER.

**Stock for Rings.**—I saw in THE AMERICAN BLACKSMITH of December and February, two articles on the size of rings. I will now give my way of figuring, which has never failed. Take a ring, say 4 inches in diameter; three times the diameter and three times the thickness of the iron, and  $\frac{1}{4}$  of an inch for every inch of the diameter, and a little for the lap. Three times 4 inches or 12 inches plus three times the thickness ( $\frac{1}{4}$  of an inch) or  $1\frac{1}{4}$  inches equals  $13\frac{1}{4}$  inches. Add to this  $4\frac{1}{4}$  inches, as indicated above, makes a total of  $14\frac{1}{4}$  inches. Now, upset the ends, then bend and weld any size. Use the same rule, whether bent on the edge or flat, it is sure to come right.

T. D. SIDWEL

**A Word from New Brunswick.**—I started with an old bellows and anvil, got \$12.00 worth of stock on tick, and started in an old shop 16 by 27, ten years ago. I am still standing behind the anvil, have built me a snug home and now have a shop 30 by 40, a good kit of tools, and some machinery such as a band saw, power drill, buzz planer, and a 6-hp. gasoline engine.

In regard to shoeing stocks. I have a pair of them, and I think it pays to have one if there are lots of bad horses to shoe.

But I think it pays better to do as I did, build one for yourself. As for selling machinery and running a shop at the same time, I don't think that pays. The place for the smith is behind the anvil if he works alone as I do. My main work is shoeing and building sleds in the winter, and repair work for the farmers in the summer.

H. H. GREER.

**He Has a Frog Farm.**—I am at present taking a little vacation from the forge. I work for the Southern Pacific. In a recent issue you ask readers to tell about their side-lines. Well, you will probably laugh when you hear of mine. I have 160 acres of yellow pine timber land and I have a frog farm, on it. I have over 2,000 young frogs. While this venture is yet an experiment, I am satisfied that it will prove very profitable. I have been catching wild frogs for 5 or 6 years and shipping them to market. I get from \$1.75 to \$3.25 a dozen for them. They grow very large here. The winter is so mild that they are out all winter when it is warm and the sun shines. I have found that raising bull frogs is more profitable than raising chickens. Frogs don't get cholera, roop or any sickness and they don't have any lice on them. It is claimed that one frog will lay 14,000 eggs in one season. The main thing is to protect the tadpoles and young frogs from their enemies. Nearly every thing preys on them.

**Prices from Nebraska.**—We have a 5-hp. Weber gas engine and run an emery wheel, a drill, 2 disc sharpeners, a bone cutter and a pump. Here are some of our prices:

Plow lays.....	\$3.50
Sharpening lays.....	.35
Pointing lays.....	.75
New subsoilers.....	.75
Sharpening planter.....	1.00
Sharpening shovels.....	.75
New shoes, each.....	.50
Reset shoes, each.....	.25
Setting buggy tires.....	2.00
Stubbing buggies.....	7.00
Sharpening discs, each.....	.20
New wagon tongue.....	3.00
Buggy tongue.....	3.00
Buggy circle.....	.75
Buggy reach.....	1.00
Spring bar.....	1.00
Buggy box.....	8.00
Buggy spokes, each.....	.20 and .25
Wagon spokes.....	.20
Wagon felloes.....	.25
Plow handles.....	.50

These are the current prices in this part of the country. WRIGHT BROTHERS.

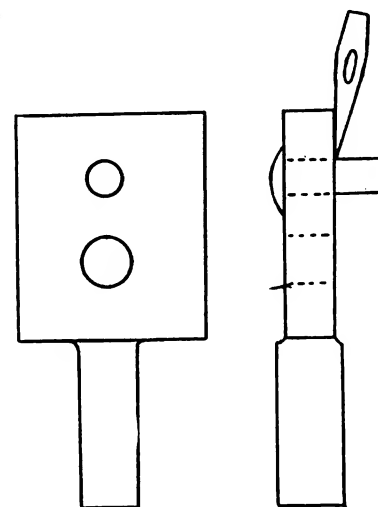
**That cold Setting Question.**—To Brother Pemberton; if a wheel is rim bound, and the tire loose or tight, I remove the fellow plate and saw out what I judge it needs. Then I replace the plate and put the wheel in my Henderson cold tire-setter; screw the dish right, and press till the spokes are tight in rim and hub. If a wheel has too much dish or is otherwise defective it will usually come out in better shape than it was before. It only requires good mechanical judgment to do the job right. I have used my machine for three years in this city, where there are six shops that do carriage work, and as I do it for half the old price, I of course meet strong opposition, but am coming out ahead.

Several of the others now come to have their wheels done. Some times heavy wheels will go the wrong way in cooling off. With my machine it is a small matter to saw out, screw the dish right and set up enough to hold them in place.

I know nothing of the other machines. But with mine, it is only a few minutes work to fix a dish just as you want it, and to keep it so. It takes from 30 to 40 minutes for a set of wheels and half price is \$1.00. No cutting but the labor, brother smiths.

S. L. LORD.

**Hardware as a Side-line.**—Some of the smiths talk of side lines to take up their spare time. I don't have any time to spare but am kept busy from morning until night, and one day last week had to work until one o'clock in the morning to finish a job by the time I had promised. The job was gumming a mill saw. I gum a good many of both mill saws and crosscut saws, but I don't consider that a side line. As a side line I handle hardware, windows



A HANDY ANVIL TOOL.

and doors, and window glass and cut it any size or shape. I started in the hardware business last winter. I was constantly having calls for bolts, nails, tools and plow castings, so I made arrangements with a wholesale hardware man to furnish me what I wanted and it has been a profitable venture for both of us. I have sold between \$1,000 and \$1,500 worth of hardware, and have the monopoly of the trade here. There are two general stores here, but they have both given up the hardware entirely to me. I don't do much repainting. I have never learned to paint, but of course, have to use a little paint on repair jobs and sometimes I give an old buggy a plain coat, but don't pretend to do nice painting or striping.

A. J. PANTON.

**To Replace an Axle Thread.**—Some time ago I put on a set of 1-inch buggy arms and they were all I had of that size. I examined them before putting them on and saw they were marked all right, 2 for the right and 2 for the left, so I welded and set them. When I tried to put the left nut on, I found that it had a right hand thread. I never let a job beat me, so I took an old axle with left hand threads



and I centered the end with the threads and drilled a  $\frac{3}{4}$ -inch hole in the end of it. Then I took a hack saw and sawed off the threads. I then sawed the threads off the axle that I had welded up, centered it and drilled a  $\frac{3}{4}$ -inch hole in that. Then I took a  $\frac{3}{4}$ -inch piece of round stock and drove it in the axle as far as I had drilled (about 2 inches). Then I put the short piece that had the threads on this rod. I now drilled two holes in the top of axle down to the piece of rod and took the piece to the forge and brazed it. When cool I dressed it up and the job was done. When the customer came for his work I told him of the misfortune with the axle and showed him how I had fixed it. I guaranteed the job and he was well satisfied. I drilled the 2 holes in top of the axle so the brass could flow onto the rod all right. W. T. JENKINS.

**A Letter from South Africa.**—In answer to the brother who wants to know how to figure stock, I would say, get a copy of Foden's Mechanical Tables which can be supplied from the office of this paper. No blacksmith should be without it. It is very convenient to carry in the pocket, and is the handiest of books. I have had other books, but this is certainly the best. I have been a smith for thirty years, and would not be without it.

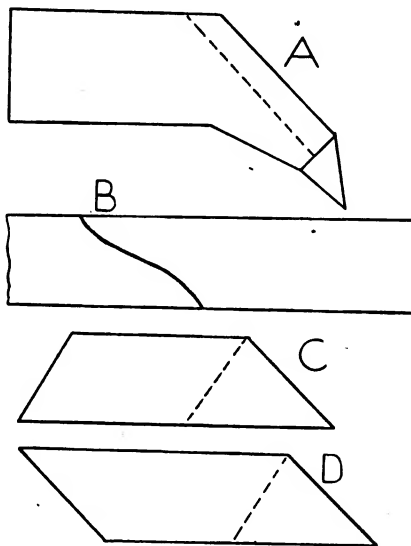
About forging a gaff hook, why not stump on the hook? If the bolster is countersunk and the sharp corner is rubbed off with a round file, it makes a good job, if properly done. I believe greatly in stumping, have done a good deal of it and have yet to see it fail. To one who has never done it, I would say, have the hole into which you hammer the piece large enough for the rod to go freely in and do not forget to round the sharpness off the hole. Then make a good head. To enable your scarf to be put well in, have the piece you stump on quite thick. I use a countersink like the round end of a hand hammer to make a good dent which makes it weld better and is also a guide to the exact spot to put it on. Take a second heat and hammer down to the thickness required. If the piece is now too broad pare off with a chisel. W. W. WATT.

**The Price-cutter.**—I want to commend Brother T. J. Wallace of Ohio, on his article on page 100 in the February number, where he speaks of "Cheap John" and "Pick-up" among the craft. Now, it does seem to me that, unorganized, we are at the mercy of these "iron spoilers." They learn the prices of the good mechanic, and are everlastingly cutting, in order to hold their own.

We attempted to organize here twice but the organization was broken each time, on account of these "jack-legs" going back on their agreement. And as a result, at present it's a case of "dog eat dog," and all are compelled to work at starvation prices. Now, it seems queer to me that a set of mechanics will tolerate such business. These fellows are genuine and original "Tom Tardys," they are about 50 years behind the times, both in their shop equipment and in their work. To say the least, they haven't a decent tool nor over a handful of stock in the tumble-down place they have the nerve to call a shop. I would be greatly pleased if

some one would give a remedy, through THE AMERICAN BLACKSMITH, how to permanently overcome this defect in the trade. H. E. KERNEK.

**How to Make a Plow-Lay.**—I see that Mr. J. M. Drew and Mr. S. J. Pemberton give the readers of your valuable paper a plan to make a plow lay, so I thought that I would give my way of doing it. For a full new bottom I take a piece of stock 3-by  $\frac{3}{4}$  and cut a suitable piece the length of the old land-side. Then I either weld on a piece at the point or else bend and then swage it, the thickness of the landside plate at the place where the landside joins on the plow side. I then bolt it; lay on plow with two bolts, one at the point and one through the brace; draw up tight. Then unscrew bottom from plow, leaving the brace on the bottom. Then take a good welding heat at the heel, open your vise three inches and weld the first heat in the vise. Then weld within an inch from the bolt at the point, then take out that bolt and take a  $\frac{3}{4}$ -inch rake tooth and rivet this in hot. When finished up, fit a slip-lay in the same way and then temper the point in tallow. But on a



MAKING A PLOW-LAY.

slip-lay I weld and finish before I drill the holes. The accompanying engravings show how I fit a lay before welding. A, in the figure is the lay; B, shows the way I cut the land-side; C, shows the plow point cut from bar 2 by  $\frac{1}{8}$ . To shape the point in this way saves cutting away the steel at the point, to get the right bevel. A short point is shown at D in the engraving. C. W. E. ANDERSON.

**A Well equipped Shop of Nebraska.**—We run two 3-hp. engines (gasoline) and can run them independently or on the same shaft, as needed. We have a trip hammer, an emery stand, a lathe, a 24-inch wood planer, a 22-inch rip saw, 2 power blowers, a drill, and a dynamo which keeps our batteries charged and also furnishes us with light if we have to work at night. We can run twenty 16-cp. lamps and the dynamo is very handy in a rush and especially when the boys are short. I also have a Badger punch and shear, and wish to say that it is certainly a tool which I can heartily recommend, as I would not part with mine if

I was offered double price and could not buy another. I employ three men most of the time and we do all kinds of work, such as case hardening plows, brazing cast iron, and making special shoes that will wear sharp as long as a horse will wear them. If any brother smith is interested, and will request me through the columns of THE AMERICAN BLACKSMITH, I will give him any information about any of the work mentioned above, and I can also give you a drawing or explain how to make a successful friction clutch, as we made four and they work perfectly. But it takes a lot of work to make the latter. J. W. POKORNY.

**A Pointed Talk from Oregon.**—I have been at the trade 18 years and have noticed that the man who stays at his business and can say *No* to the poor-payer "gets along some." Liquor has hurt the blacksmith more than anything else. People have gotten into the habit of going every place except the shop for every thing they want. There was a time when people went to the shop for every thing. We ought to get that trade back, and could, if we would buy hardware instead of whiskey. I carry a stock of such things as chain clevises, neck yokes, whiffle-trees, bolts, handles, rubber blocks, whipsockets, dashes and lots of such stuff. But it is hard for people to understand that I keep such things as no other smith ever did it here. I intend to put in a stock of shovels, forks, axes, hoes and such things as the dust of the shop will not hurt. It doesn't take me from my work, because my customers pick out what they want without any help. All of the above, belong to the smith, and he ought to have it and I get several dollars a year this way that I don't have to work for. Smiths ought to be friends. It is not the good workman nor the poor workman that makes a go of it, but the man that tends to business. Buy right and Sell right. Sell as cheap as the storekeeper can, and discount all your bills. AL. HART.

**A Good Talk on Shoeing.**—Brother Woodside tells us how to make some tools that are very useful to the smith. As I have been making a flatter, I will tell how I made it. I took 7 inches of  $1\frac{1}{2}$ -inch square tool steel, backed up one end to about  $2\frac{1}{2}$  inches, then put a square block in the hardy hole of the anvil for the piece to rest against. Then commence where it is staved and with a  $\frac{3}{4}$  inch fuller work it down to  $3\frac{1}{2}$  inches square, pinch the eye, brace the corners off at the top and the job is done. This makes a tool that will stand any kind of a blow.

I will tell next how I do my horseshoeing. Keep in mind that the first principle of horseshoeing is to fit the foot first, then the shoe to the foot. See that the feet are in line with the body, and if the conformation of the feet and legs is correct; next comes the shoe which is to be calked and fitted to the foot. I make the calks about  $\frac{3}{4}$  of an inch high. Round off at the heels, trail out sides slightly, more behind than in front and fit full to foot. Be sure that it is level with no pressure on the heel. Before nailing on, I take off all rough edges and brighten at the heel. Then I drive my nails higher at the toe because the wall is thicker. I then draw my nails, nip off the clinches, rasp under the clinches enough to take off all rough

edges and then clinch down, so when the rasp runs over the foot it won't weaken the clinches. I then rasp it just enough to smooth it up.  
J. L. FORTNEY.

**Self-sharpening and Hardened Calks.**—I see one brother smith has asked how to harden common calks on shoes, or as we call it, "pot metting and steel plugging." I will give the way both are done. In this section of the country, pot metting is, first sharpening the calk and then taking a piece of pot metal and laying on the inside of calk. Hold the calk in fire until the metal runs over the inside of calk, then plunge in water. This will make it so hard that it cannot be filed. But cannot recommend this as much as the other plan, that of steel plugging. Take old mower sections, place section in vise, so just enough sticks above the jaws to make a good wide calk. Now take the hammer and break a piece off. In this way you can get enough to make the centers for calks. Now take two strips of thin iron, just wide enough so that drawn they will make a toe calk. Now lay the strips of section which you have broken off, between these strips of iron and weld together, making toe rod. Then cut calks off, of this, to suit. This is for the toe only. For the heel, split the calks and place a piece of mower section in. When shoe is new, before you turn the calk, split it the same shape as the calk will be split and place a piece of mower section in between and weld. Then turn and draw calk. When shoe is fitted, heat all of the calks to red heat and plunge in water. If done successfully, they will not need much change for a long time, as they wear sharp.  
L. F. STILLIANS.

**A Home-made Smithy.**—Sometime ago, one of "The Brethren" gave a description of his first shop. I think I can beat him in crudeness and makeshifts. I was about 14 years old, when I wanted to be a blacksmith but could not find a smith who wanted a boy, so I started a shop of my own. I got a cheese box, knocked the bottom out and cut two wheels out of inch-plank to fit the rim. Then I made a spindle 1½-inches square and mortised it out and put fans in it like I had seen in a grain fan. I then got the nozzle of an old bellows, fitted it in one side of my cheese box and mounted it on a 2-inch plank. I then covered it with bagging and tarred it to make it air tight. Now I put a 2½-inch pulley on the spindle, got an old wheel from a horse-power, and put a crank on it to run my fan. From several pair of old boot legs I cut strips about 2 inches wide for a band. For a forge, I got a flour barrel, cut one side down about half way and filled it up with dirt, banking it well up over the nozzle of my blower. For an anvil I got an old flat iron while the horn was a ¾-inch round harrow tooth. Both these were spiked and stapled on top of a block. An axe, broken in two at the eye served as a hardie. I found two pairs of old rusty tongs, and I had an old broken shoe hammer that probably weighed 8 ounces. An axe was used as a sledge and for fuel I used pine bark. I could not see my fire when I was turning the blower, so I would start the fire, put my iron in, step back and turn the crank until I thought the iron

ought to be hot. Sometimes I would blow every particle of fire out and the iron would be as cold as when I put it in. Of course I could not get heat enough to weld iron but I could get heat enough to hammer out small pieces and bend them such as making lap links, staples and such other articles.  
A. J. PANTON.

**Solving the Apprentice Question.**—Mr. C. L. Higinbottom asks several questions in the March number. Perhaps I can answer some of them. He asks; "Why is it that we can't hire a good honest man who is a good mechanic?" It must be that the demand is greater than the supply. This is partly because of getting too poor stock for apprentices and partly because of the way apprentices are brought up. Most of them are taught to drink, use tobacco, and participate in other vices and these are about the first things they learn. I think the reason for poor stock is that the pay is poor. A man should be careful in the selection of an apprentice, and then look on him as a son as far as possible. Try to teach him all you can both from a practical and theoretical standpoint, also look after his moral surroundings and don't try to get all of the hard work out of him. I have two apprentices and pay them eight cents an hour for eight hours a day; 12 cents an hour for the first four hours overtime 16 cents an hour for time after that; and 16 cents an hour for Sundays and holidays. This price is for the first six months. I have a lot of good books and papers, a few games, a printing press and good supply of type that they are always welcome to come to my house and use, or take home. They are two as fine boys as can be found, but if I see that this business don't suit them I will try and find them another place. For it's doing the boy and yourself a wrong to keep him when you see he won't make a good workman.

The best way for a man who doesn't have enough spring tempering to keep his hand in, is to use fish-oil. Heat the spring evenly, cool it in the oil till you can hold your hand on it, then rub a file over it, say, three different sides, then burn the oil off. If the oil is stiff, this will be enough to bring the spring to a dark pale blue. I mean, let the deep blue run out, then cool it and give it a severe test. If too soft, have a little harder next time. A man has to do that all the time to do the best work without seeing the colors. There are so many conditions to consider in burning the oil off without seeing the colors. He asked how to temper brass springs. There is no way to temper them. I want to have one of my boys make drawings of some good tools that I have made. Some one may like to make some like them; it may help my brothers.  
R. E. STEPHENSON.

**The Manipulation of Tool Steel.**—This is rather an important subject, especially the high carbon steel. First I would say that I have any number of tools to make I have found it good practice to forge tools first, and let them get quite cold before tempering them. I work the steel at as low a heat as possible and as quickly as possible but not with a heavy blow, as this destroys the grain by crushing it. Consequently when the steel is

tempered, it will develop what are called tempering cracks, but which are really caused by too heavy blows in forging. When quite cold I reheat the tool just hot enough to give it sufficient hardness. Then plunge it gradually to the upper end of the red, also pulling it out gradually. This will give a tapering from low red at upper end to a cold point, leaving the tool without any or very little contracting strain. Then ease off, temper to desired color, and generally speaking, if steel is of ordinary good quality the tool will be good. This is our practice on lathe, planer, slotter, twist drill, reamers, rose bits and similar tools made of high carbon steel. Milling cutters and such tools we forge the same way, but in tempering we use a small charcoal furnace, and lay our tools in the furnace on a good bed of fresh red coals; then we put more coal on top of them and close the door of the furnace. Let the cutter get hot as the coal burns up, while the tool dresser is at work on other tools. When hot we plunge it into a tempering liquid slightly heated. To draw temper place a piece of ordinary plate iron on a bed of charcoal left in the furnace. Place the cutter on it and let it get hot slowly all through and it is surprising how nicely it will draw color.

In forging a tool we generally follow the directions given by the manufacturers of the steel. But in hardening, is where the difficulty lies, for I have found that steel deteriorates rapidly by repeated tempering. It gets soft after two or three times tempering. This is due, I think to the high heat necessary for hardening. The point for us to discover is, how to harden this steel at a low heat, and thus preserve its quality. I have tried the ordinary tempering mixture and also warm water. The steel will crack easily. With oil it is better, but not hard enough for hard tires.

I am now experimenting with a liquid that certainly makes the tool hard enough at a greatly reduced heat, but whether it will keep its cutting power, I am not prepared to say at present. But our practice is for lathe, planer and such machines, and where speed is high and material hard to harden in an air blast at white sweating heat. For taps, reamers, twist drills, milling cutters and such like, that have to be finished to a cutting edge before tempering, I have used the lead bath for heating and cooling in air where convenient and in oil when necessary. When air is used great care must be taken or the fine edge will be blown off, but the lead bath, where only one or two pieces are to be tempered, is very slow and inconvenient.

I have found the following plan very good in this kind of work: I mix some fireclay very thin, almost a liquid, then heat the tools just warm, not red, and dip them in the fire clay, then pull them out and let them dry, which only takes a short time. Repeat this until you have a layer of clay on the tool sufficient to protect them from the heat of the fire or blast, or ½ of an inch thick; place them in the fire, heat to a desired point and cool in blast or oil. We have found that this protects the cutting edge and is done very quickly.  
ARTHUR STOCKALL.

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AND

**BLACKSMITHS'  
TAPER TAPS.**

*These taps are made of good tough steel with the threads well cleared.*

*They cut free and clean.*

**THE STANDARD  
TOOL COMPANY,**

**CLEVELAND. NEW YORK.**

## **Vulcan**

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**V**stands for **VULCAN**;  
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You Can Never Go Wrong.

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**SEYMOUR, CONN.**  
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are made from tough, durable, lively New RUBBER. Quality is the first consideration. Our "Wing" Tire will outwear several ordinary rubber tires. The wings (see cut) keep water, sand and grit from working between the channel and the tire, to wear out the tire from underneath. Write for particulars.



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Carriage Tire Department,

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Boston, New York, Buffalo, Chicago, Cincinnati, Detroit,  
St. Louis, Denver, Los Angeles.



# **SUPERIOR Horse Rasps**

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Best High-grade Steel.  
Hard, Thorough Temper. Sharp Cutting Edge.  
Sharp, Strong Teeth, Well Backed.

## **Every Rasp Perfect**

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Made in all regular sizes, and in the new 18 inch Slim,  
which gives the user the advantage of a long stroke,  
— and at the same time a rasp of medium weight. —

## **ASK YOUR DEALER FOR THEM**



**Prices Current—Blacksmith Supplies.**

The following quotations are from dealers' stock, Buffalo, N. Y., May 10, 1906, and are subject to change. No variations have taken place since last month's quotations.

All prices, except on the bolts, are per hundred pounds. On bars and flats prices are in bundle lots.

**Bars—Common Iron and Soft Steel.**

$\frac{1}{2}$ in. round or square; Iron, \$2.80; Steel, \$2.80	
$\frac{3}{4}$ in. " " " 2.40 " 2.40	
$\frac{1}{2}$ in. " " " 2.20 " 2.20	

**Flats—Bar and Band.**

$\frac{1}{4}$ x 1 in. Iron \$2.40; Steel \$2.40	
$\frac{1}{4}$ x $\frac{1}{2}$ in. " 2.30; " 2.30	
8-16 x $\frac{1}{2}$ in. " 2.50; " 2.50	

**Norway and Swedish Iron.**

$\frac{1}{4}$ in. round or square \$4.90	
$\frac{3}{4}$ in. " 4.50	
$\frac{1}{2}$ in. " 4.30	
$\frac{1}{4}$ x 1 in. 4.80	
$\frac{1}{2}$ x $\frac{1}{2}$ in. 4.20	

**Horseshoe Iron.**

For No. 1 shoe, $\frac{3}{4}$ x $\frac{1}{2}$ in. \$2.50	
For No. 2 shoe, $\frac{3}{4}$ x $\frac{3}{4}$ in. 2.50	
For No. 3 shoe, $\frac{3}{4}$ x $\frac{3}{4}$ in. 2.50	
For No. 4 shoe, $\frac{3}{4}$ x $\frac{3}{4}$ in. 2.50	

**Toe Calk Steel.**

$\frac{1}{2}$ x $\frac{3}{4}$ in. and larger \$3.00	
---	--

**Spring Steel.**

$\frac{3}{4}$ to 1 $\frac{1}{2}$ in. Rounds. Op. Hearth \$3.00, Crucible \$5.00	
$\frac{1}{4}$ to 6 in. by No. 4 " 8.00, " 5.00	
gauge to $\frac{1}{2}$ in. Flats " 8.00, " 5.00	

**Carriage Bolts. (Net Price per Hundred).**

$\frac{1}{4}$ x 2 in. \$0.54	$\frac{3}{4}$ x $\frac{1}{2}$ in. \$0.82
$\frac{1}{4}$ x $\frac{1}{2}$ in. .58	$\frac{3}{4}$ x $\frac{3}{4}$ in. .96
$\frac{1}{4}$ x 8 in. .62	$\frac{3}{4}$ x 8 in. 1.31
$\frac{1}{4}$ x 10 in. .65	$\frac{3}{4}$ x 10 in. 1.70
$\frac{1}{4}$ x 16 in. .75	$\frac{3}{4}$ x 16 in. 2.10

**PATENTS**

Write at once for most liberal offer ever made for obtaining patents and ask for inventors' guide, the best book published Est. 20 yrs. W. L. R. MOORE, Wash. D. C.

**CUMMINGS & EMERSON**  
Blacksmith and Wagon Makers' Supplies,  
PEORIA, ILL.

**The Campbell Iron Co.**

ST. LOUIS, MO.

Carry complete line of Horseshoers' Supplies, Wagon and Carriage Material.  
WESTERN AGT. FOR DITZLER COLORS IN JAPAN.  
Write us your requirements.

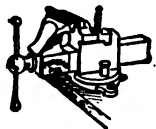
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STEEL STAMPS  
AND STENCILS**  
SEND FOR CATALOGUE.

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BUFFALO, N. Y.

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Want and for sale advertisements, situations and help wanted, twenty-five cents a line. Send cash with order. No charge less than fifty cents

**FOR SALE**—1,000 of the best tire coolers made. Address **M. L. WOLFE & CO.,** Miamisburg, Ohio.

**FOR SALE**—Shop and contents. Rent cheap. Address **WM. LONHART,** Arvada, Colo.

**FOR SALE**—Blacksmith and wagon shop, one or both, doing a good business.

**TAYLOR & FORSYTH,** Viola, Ills.

**WANTED**—A general blacksmith. Will give a steady job to a good reliable man.

**E. A. WENDT,** Tea, So. Dak.

**FOR SALE**—Blacksmith and wood working shop. Engine and complete set of tools. Address **A. G. B.,** Lock Box 25, Malmö, Neb.

**FOR SALE**—Blacksmith shop and tools; work for two men; write for information. Address **J. E. MAY,** Almena, Barron County, Wisconsin.

**FOR SALE**—Blacksmith shop with tools and dwelling. Good location. Write for particulars. Address **A. SCHUMACHER,** Manchester, Mo.

**WANTED**—To correspond with salesman visiting the blacksmith trade in the east. Address **MISSOURI, MO.,** Care American Blacksmith Buffalo, N. Y.

**FOR SALE OR RENT**—General blacksmith business. Good location, good prices, good reason for selling. Address **BOX 32,** Nabton, Wash.

**FOR SALE**—Blacksmith and wagon shop with power machinery, tools and stock, with or without dwelling. Address **E. E. HULL,** Jesup, Ia.

**FOR SALE**—Carriage shop doing a good business. Only shop here, good town, good country. Liberal terms. Write **A. J. THOES,** El Reno, Oklahoma.

**FOR SALE**—A Henderson tire setter. Has been used but little. Will take \$25.00 cash. Reason for selling, I have bought a Brooks. Write or address **J. B. NICHOLS,** Inman, Kansas.

**WANTED**—Salesman who visits the carriage trade to sell our wheels with steel and rubber tires, as a side line, on commission. Big commission. Write to **THE BOOB WHEEL CO.,** Cincinnati, O.

**FOR SALE**—Blacksmith and implement business cheap. Excellent location, established trade, complete equipment. Will sell at a bargain. For full particulars address **WILLIAM GRAHAM,** Union, Oregon.

**FOR SALE OR EXCHANGE**—One pony planer, mortising machine, boiler and engine, gasoline engine, 4-H. P., good repair business, with tools for farm wagons, buggies, etc. Address **WORLEY CARRIAGE CO.,** Keokuk, Iowa.

**HERE, NORTHERN ILLINOIS BLACKSMITHS**—We have call for good shop in good town. Proposition must be A. 1. Will pay cash up to \$10,000. Might consider other States adjoining. Address **HILES & MYERS,** A 25 Matthews Bldg., Milwaukee, Wis.

**FOR SALE**—Good horseshoeing, carriage building, repairing and painting business with stock and tools, shops 80x70, two floors. House, lot and barn, all in good condition. For particulars address **R. S. DENNEY,** New Hackensack, N. Y.

**FOR SALE**—In northern Illinois, modern 2-story brick blacksmith, wagon and paint shop, with 2-story, roomy, frame dwelling. Two fires and work for two men year around. In fine farming country where good prices prevail. Barn, chicken houses, fruit trees, garden, one acre in all. Property in country village with usual advantages of churches, stores, etc. \$2,000. See our ad in March number. Address **HILES & MYERS,** A-25 Matthews Bldg., Milwaukee, Wis.

**FOR SALE**—Blacksmith, wagon and shoeing shop, with a complete stock and all up-to-date machinery, such as gasoline engines, trip-hammers, emery wheel, circular saw, disc sharpener, spoke tenon, drill, grindstone, power blower, pump, shears, cold tire setter, shearing rack and all other necessary tools of all kinds. Plenty of work for two men. Price \$2200. Or will sell residence with it, which will then make it 6 lots altogether on Main street. 8 room house nearly new, cistern, 2 wells, a lot of fruit and shade trees, barn 18x28, 14 feet high, nearly new. Price altogether \$4000. Address **N. P. J. SONDERGARD,** Ramona, Kansas.

**FOR SALE**—One of the best equipped shops in Denver. Will sell blacksmith shop 20x75 feet, wood shop 23x75 feet, each one story brick, up-to-date tools and machinery, also store buildings with living rooms above, all for nineteen thousand dollars. Reasonable terms, nine thousand down, balance in ten years time. Or will sell complete equipment, tools and machinery for three thousand dollars. Shop and five living rooms rent for \$25.00 per month. Other buildings now bringing \$100.00 per month. For full particulars address **SHOP OWNER,** 1447 South Broadway, Denver, Colo.

**WANTED**—Salesmen and Agents in all Eastern and Gulf States, and foreign countries on per centage, to sell our Gasoline, Kerosene and Marine Engine and Producer Gas Plants.

We have an attractive proposition to offer. **MODEL GAS ENGINE WORKS, B-21** Produce Exchange, New York U. S. A.

**FOR SALE**—Shop and established blacksmith business in one of the most attractive sections of Ontario. Blacksmith Shop 25x40 feet. Brick barn 25x36  $\frac{1}{2}$  feet, on stone foundation 9 feet high. 25 rods of hedge fence along front; 5 acres of beautiful fruit bearing land. Price \$6,000. Owner must sell on account of poor health. Address **W. A. DEAN,** Erindale, Ont.

**PATENTS**

Send sketch or model for free examination and report as to patentability. Patents promptly secured. Advice free; terms low; highest references, and best service. Address,

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**\$60** GOES LIKE SIXTY  
SELLS LIKE SIXTY  
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**GASOLINE ENGINES**  
for Pumping,  
Churn, Cream Separator,  
Washing Machine,  
Ice Cream Freezer, etc.  
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39 Park Street.

**West's Dressing** has stood the test for 35 years.

Will not crack or injure the finest leather.

Sold by Dealers Everywhere or Address,  
**WEST MANUFACTURING CO.,**  
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**BLACKSMITH'S FRIEND  
TIRE SETTER.**

The only tool that will pull on a heated tire and finish it. Saves time, keeps them from splitting, saves time, patience, gives satisfaction and is fully guaranteed. Weighs 15 lbs. with four foot handle. Tire can be heated warm enough on the forge.

PRICE, \$4.50. Cash with order. Remit \$1.00 if sent C. O. D. Circulars free Plymouth, 9-18-05.

We are using the Blacksmith's Friend Tire Setter and are glad to say it does the work. Just try one of these tools and you'll not be without it. H. C. Loveland & Son.

**SILCOTT'S PATENT IRON AND ADJUSTABLE FIRE POT.**

It works automatically. Construction simple and reliable. The valve cuts off suction of gas into pipe or bellows. It does not clog up. The bottom of bowl is open. Ashes pass through. The speed of a smith depends on a good fire. Heats directly in center, produces clean white heat. It will not burn out, as it is air cooled. It holds fire from 3 to 6 hours when not in use. PRICE \$5 to \$8. No. 2, the size mostly used, complete, \$6. A No. 2 Tugger Iron, Pot and tire Setter, complete, \$10.

**GEO. W. TINKEY,**  
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# LONE STAR

## Brazing Holder

### AND COMPOUND

#### MAKES BRAZING QUICK AND EASY

By using this machine you never lose your work in the fire. You can lift your work from the fire as soon as it is brazed, causing no loss of time.

This machine is adjustable to almost any shaped casting or machinery to be brazed, holds the broken parts firmly together, insuring perfect shape and a perfect job of brazing.

We put out with each holder enough compound to do from \$50 to \$100 worth of work. Price complete, \$10.00, price of Holder alone, \$6.00. Correspondence solicited.

#### WHAT OTHERS SAY.

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THE LONE STAR BRAZING CO., Krum, Texas.

Gentlemen: I am using your Brazing Compound and Holder and in regard to the Holder I wish to say that it is the most complete piece of machinery I ever saw. It is just the thing that every smith needs and I would heartily recommend both Holder and Compound to my fellow craftsmen. I find the Compound far exceeds any thing of the kind that I have ever used.

Yours truly,  
W. W. RATLIFF, Blacksmith and Machinist.  
Muenster, Texas, April 24th, 1906.

THE LONE STAR BRAZING CO., Krum, Texas.

Gentlemen. I will write you a few lines to let you know that I am well pleased with your Brazing Outfit and heartily recommend same to anyone needing a Brazing Outfit. The Holder is more than you can claim for it. Enclosed find check for \$10.00.

Yours truly, J. S. SCHMITZ, Blacksmith and Machinist.

**LONE STAR BRAZING COMPANY,**

**KRUM, TEXAS**

## Something to Notice.

Instead of being able to use the dies (four to a set for each diameter) for our tools for just the diameter marked on them, one



can thread

"DUPLEX" DIE STOCKS.

two or three besides, because of their wide adjustability, thus covering several over sizes and a little under size.

Manufactured by

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Invest in some good books and then judge for yourself if it doesn't pay. Their pages tell you how to do many a difficult job. You cannot afford to be without these:

#### Forge Practice.

A most valuable treatise upon forge work by John L. Bacon. The book is profusely illustrated and contains chapters on welding, upsetting, drawing out, bending, metallurgy and calculation of stock, also tables and formulas. It has over 250 pages and is very neatly bound in red cloth. Price, \$1.50

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is a well illustrated book on general smithing by J. G. Holmstrom, a practical smith. It tells how to make but her knives, hammers, chisels, plowshares, wrenches, etc. Contains chapters on case hardening, babbitting, drilling and welding. Contains over 200 pages and is handsomely bound in half-leather. Price, \$1.00

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A very complete treatise on the painting of vehicles by M. C. Hillick, a master in the art of vehicle painting. The book is just filled with sound, practical information. Fully illustrated and bound in red silk, library cloth. Contains over 150 pages. Price, \$1.00

Any of the above books will be sent postage prepaid upon receipt of price.

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NO. 465 THE L. S. STARRETT CO. ATHOL, MASS. U.S.A.

Made from hard rolled sheet brass one-tenth in. thick, one and one-sixteenth in. wide, with heavy graduations and figures, graduated from the end in sixteenths of an inch on one side and from the inside of the hook in sixteenths of an inch on the other, adapting them for taking correct measurements from either the outside edge of a hot piece of iron, or from the inside when held against a corner. Graduated twelve inches, have flat handles and measure over all 16 1/4 inches.

Price, postpaid, \$1.15.

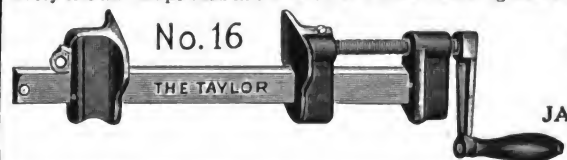
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Quick-Acting, Self-Locking.

Every size and shape used in the wood and metal working trades.



Get our Catalogue before placing your next order.  
**JAMES L. TAYLOR MFG. CO.,**  
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Style No. 0,  
Cyclone  
Portable  
Forge

Easy  
Running.  
Powerful.  
Large  
Capacity.

## CYCLONE PORTABLE FORGE

The Cyclone Portable Forge, shown here, is a favorite everywhere. Suitable for heavy, as well as light work. Has a 28x40 in. hearth, large capacity coal box and a 14 in. fan. The deep firebox and powerful blast make the Cyclone Style No. 0 capable of doing the heaviest kind of work. The Cyclone has double Ratchet, Adjustable Legs, Solid Frame, Detachable Lever hung on Ball Joint and swinging in chilled seat. FULLY GUARANTEED.

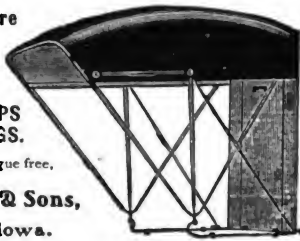
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a Complete

Line of

CARRIAGE TOPS  
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Write to-day.D. A. Laros & Sons,  
Grinnell, Iowa.

## New Books.

IN PRACTICAL PATTERN MAKING, the author, F. W. Barrows, treats in a very complete and practical way the subject of pattern making both in wood and metal. The author, who has had many years experience at the bench, handles his subject in a very brief and concise manner, and the professional as well as the amateur pattern maker will find this book replete with practical instruction and useful information. Mr. Barrows touches on all branches of the subject from materials and tools to the marking and recording of the finished pattern.

THE INCREASING DEMAND for cheap power requiring no licensed engineer has also increased the demand for literature on this subject and the present users and intending purchasers of motors of the gas engine type will find in the fifteenth edition of Gas, Gasoline and Oil Engines a most complete work on this subject. Mr. Gardiner D. Hiscox, M. E., the author, treats this subject fully and comprehensively and while former editions of this work have been thorough, the new edition has been rewritten, enlarged and revised until it covers the entire field of gas and oil motors with a chapter on producer gas plants.

JOHN K. BARTON, Commander, U. S. Navy, and head of Department of Marine Engineering and Naval Construction, is the author of Mechanical Processes, "a practical treatise on workshop appliances and operations for the instruction of midshipmen at the U. S. Naval Academy." The author has endeavored to produce a book directly suited for the particular field for which it is intended and a glance at the contents pages shows that he has succeeded. Mr. Barton touches upon all branches and departments of mechanics, and from the first chapter on the production of construction materials the student is taken step by step through the mazes of steel manufacture, pattern-making, molding and casting, brass founding, forging and machining, with separate chapters on tools, machines, mills, shops, equipment, and an appendix of data and useful information. In short, the apprentice, student, smith, machinist, and allied craftsmen will find in Mechanical Processes such information and instruction as is found in no other one volume.

## Trade Notes and Literature.

IN SAN FRANCISCO during the terrible earthquake, the plant of the Pacific Hardware & Steel Co. suffered but slight damage. Business has been resumed and this company advises us that prompt attention will be given to all orders as heretofore.

AMONG A FINE LINE of first class tools the Morse Twist Drill Co., New Bedford, Mass., are advertising three-groove bit stock countersinks, the included angle of cutting being 82 degrees. Countersinks with other angles are made to order at special prices.

WORD COMES TO US that Mr. E. H. Pasmore who has had charge of the Detroit Branch of The Crucible Steel Company of America, for a number of years, has resigned to take a similar position with the Columbia Tool Steel Company, at 49 West Lake St., Chicago, Ill.

THE R. M. CORNWELL CO., Syracuse, N. Y., have issued an interesting catalogue of 48 pages describing and illustrating the Wonder gasoline motors. The important features of this fine engine are carefully brought out. Shop owners who intend to install power should get a copy of this catalogue.

CRAY BROS., CLEVELAND, O., recently sent us a copy of their new net price catalogue. The book shows a large supply of goods for the blacksmith and wagon maker and gives some very attractive prices. Readers would do well to drop Cray Bros. a postal asking for the book, which will be gladly sent upon request.

THE DAVIS ENGINE, advertised as the simplest engine built, is said to be in constant daily use by shop owners in thirty-four States and territories in the United States. In six provinces in Canada, and in many states in old Mexico. Descriptive circulars and interesting prices may be had by addressing the Cascaden-Vaughan Co., Waterloo, Iowa.

ATTENTION IS CALLED to page 21 where appears the announcement of W. T. Daum & Bro. These roller reach irons have been given a thorough test by the trade and the constant growing demand for them shows that they have proven their worth. The illustrations on page 21 show how they are used and one can readily see that they have many advantages.

PATTERSON, GOTTFRIED & HUNTER, New York City, are constantly adding new tools, and practical shop devices to their splendid line of supplies. Recent circulars from this firm describe an adjustable emery wheel dresser and a Ratchet tap wrench. Both of these are handy and practical, time and labor savers. Descriptive circulars will be forwarded for the asking.

"Tools That Wear"

HELLERS' CELEBRATED AMERICAN HORSE RASPS  
FILES AND FARRIER'S TOOLS

will save you Time and Money. Their Superior Quality sets a known and tested Standard of Excellence. All made from our own Production of Special Refined Clay Crucible Steel and tempered by a Secret Process. New Catalogue Mailed Free on Application.

SCOTCH PATENT DRIVING HAMMER.

HELLER BROTHERS CO., Newark, N. J., U. S. A.

It's the  
SPARK  
that  
CountsIgnite your engine with our  
IMPROVED I. C. C.

JUMP SPARK COILS

We guarantee them against all imperfections in workmanship and material. Write us if your engine doesn't work properly.

INDUCTION COIL CO.

COILS FOR BLACKSMITHS. MILWAUKEE, WIS.

THE BATES AUTOMOBILE CO. of Lansing, Mich., have gone out of business and sold all of their material on hand to the Western Tool Co., who are cleaning it out at very attractive prices. See ad on page 85 this issue.

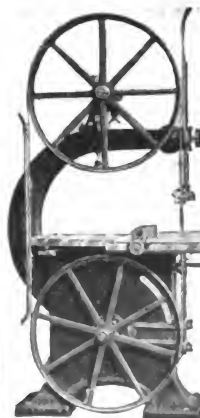
"HERCULES" screw cutting tools and machinery, manufactured by E. F. Reece & Co., Greenfield, Mass., are fully described in the new catalogue No. 6 just received. The catalogue is illustrated, contains interesting prices and American Blacksmith readers are invited to write for a copy which will be sent free of charge.

A MOST INTERESTING CATALOGUE has been received from the Star Corundum Wheel Co., Detroit, Mich., giving illustrations of a complete line of emery and carborundum wheels, grinding machinery and sharpening devices. The catalogue gives valuable hints on the use of wheels, rules for calculating speed and diameters of pulleys, also several valuable tables. Write for a copy.

REPRESENTING A HIGH GRADE LINE of builders' hardware, vises, anvils, steel registers, etc., Mr. R. S. Hickey, we are advised by the Columbian Hardware Co., Cleveland, O., has just started on an extensive trip through Missouri, Kansas, Nebraska, Iowa, Minnesota, North and South Dakota, Colorado and Wisconsin. Mr. Hickey is well known and is always cordially received by the trade. The Columbian Hardware Co. have just placed on the market a new line of splendid wrought steel registers.

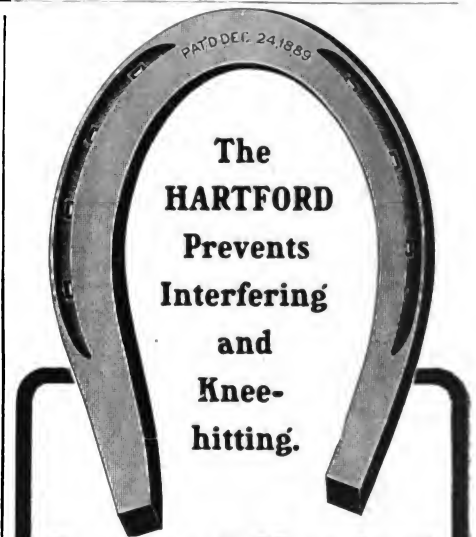
WITH WELDARINE, it is said, you can braze any casting that you can get hot and make it as good as ever without patches of any kind. Many shop owners through the country who have tested this compound say that they would not be without it, as it is a labor saver and a money maker. The Weldarine Mfg. Co., Topeka, Kansas, make a special offer to our readers on another page of this issue. Every blacksmith can make money mending broken castings and it should pay you to test the merits of Weldarine.

A NEW IGNITION APPARATUS has been added to the Robertson Straight Line Automatic Engine, which dispenses with batteries, coils, magnetos, etc. The writer had the pleasure of looking over the engine during a recent visit to the new up-to-date plant of the Robertson Mfg. Co. at Buffalo, N. Y. The engine seems to fire the charge every time at the proper instant and there is little danger of the engine stopping upon the ignition question. Mr. Robertson says: "While this ignition apparatus costs a little extra, we are going to put it on every engine from now on, believing that our customers will appreciate this feature of our engine, the most reliable on the market."



THE CRESCENT ANGLE BAND SAW recently put on the market by the Crest Cent Machine Company, Letonia, Ohio, is worthy of special mention. Other machines have been produced in which the saw itself is arranged to tip and the table remains level, but the accompanying engravings show a new machine believed to effect the desired object in a more practical manner than former designs along the same plan. All parts in the new saw act automatically, no adjustment being necessary to change the angle of the saw.

The saw will tilt to an angle of 45 degrees, a stop being provided at that point and may also be tilted forward 4 degrees beyond the perpendicular. Any reader will receive detailed information and prices by addressing The Crescent Machine Co., as above.

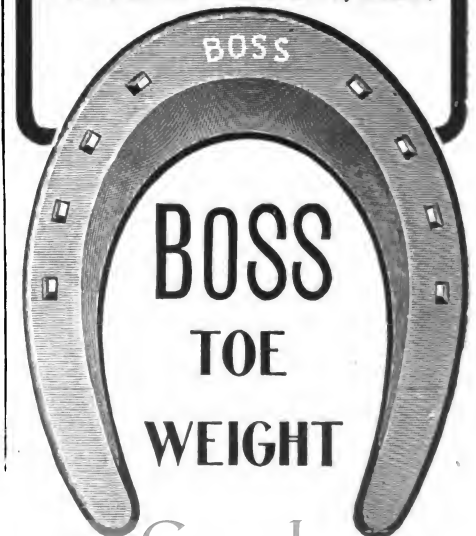


The  
HARTFORD  
Prevents  
Interfering  
and  
Knee-  
hitting.

Boss and Hartford  
SHOES

Have the highest reputation among the trade. Conceded to be the best sideweight and toe weight shoes made in this country. Cost same as inferior makes. Mean less labor. Are far superior to a hand made shoe and always give good satisfaction. Sold by all leading jobbers. Sample pair sent post paid for 50 cents. Send for circulars. They are free.

THE SIDEWEIGHT HORSESHOE CO.,  
Mechanic St. Hartford, Conn.



BOSS  
TOE  
WEIGHT

# HARVEY BOLSTER SPRINGS

**CHANGE A FARM WAGON INTO A SPRING WAGON.**



*They are made of the same grade of spring steel, formed, tempered and tested just as carefully as the finest carriage springs and they ride just as easy. They are designed to gain strength as the load increases. Every part is perfectly adapted to the strain put upon it. This combination of easy riding qualities and strength is the result of twenty years experience making Bolster Springs. A good spring made of the best steel, tempered just right, will retain its strength and elasticity for years. An inferior spring will lose these qualities.*

## INSIST ON GETTING HARVEY SPRINGS

**They Ride Easier and Last Longer than any Others.**

*The only way to be sure you are getting the best is to buy a spring with an old, established reputation.*

*You can always rely on HARVEY springs.*

### SOLD BY DEALERS

*In all large cities but not sold by mail order houses.*

*Our stock is complete and we are prepared to make prompt shipments.*

*We also make all styles of carriage and automobile springs.*



**SEND FOR OUR  
BOLSTER SPRING CATALOGUE.  
IT'S FREE TO YOU.**

# Harvey Spring Company

**Racine Junction, Wis.**



## WE GUARANTEE THE COLUMBIAN ALL STEEL ANVILS.

A TRULY TRUE RING anvil, made of best steel, built on scientific lines, with the weight properly distributed. There is no possibility of face parting, and the Columbian is tempered to suit the average smith. Our guarantee indicates the confidence that we have in our anvil.

## THE COLUMBIAN SOLID BOX WROUGHT STEEL VISE

Has reached the point others are striving for.

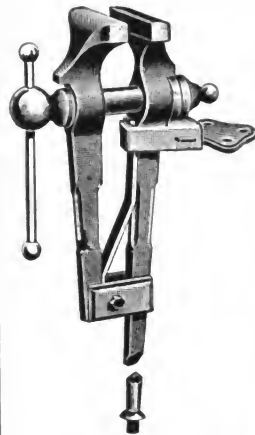
### WHY?

It's overweight.

It's made from high grade stock by first-class workmen.

Every pound of metal is in the right place to produce strength.

It's jaws are forged from one piece of special ingot steel and are faced with crucible tool steel.



It's jaws are from one-quarter to a half inch wider than other makes.



CATALOGUE

NO. 16

Will give you

List Prices.

SENT on REQUEST.

**The Columbian Hardware Co.,  
CLEVELAND, OHIO.**

168 Church St.,  
NEW YORK.

132 Market St.,  
SAN FRANCISCO.

26 Lake St.,  
CHICAGO.



Made  
in  
3  
Sizes

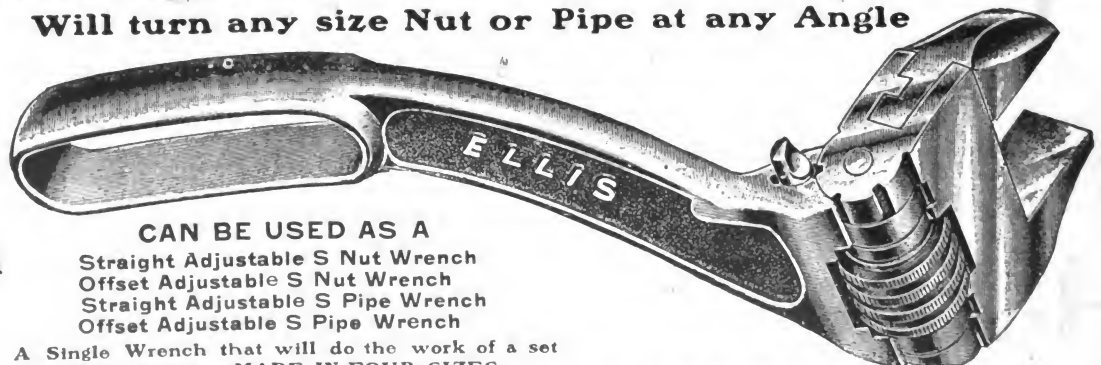
## The Perfect Power Hammer

has no equal for simplicity and efficiency. Does a wide range of work from the lightest forging to heavy axle welding. Note the long guides, insuring a direct vertical stroke. No side motion. Easy to operate from the lightest tap to the heaviest blow. The Disk Attachment free. No other Hammer has this advantage. It only requires one Horse Power to run it. Write for prices.

Macgowan & Finigan Foundry & Machine Co.  
ST. LOUIS, MO.

The  
**4 in 1  
Ellis  
Wrench**

Will turn any size Nut or Pipe at any Angle



### CAN BE USED AS A

Straight Adjustable S Nut Wrench  
Offset Adjustable S Nut Wrench  
Straight Adjustable S Pipe Wrench  
Offset Adjustable S Pipe Wrench

A Single Wrench that will do the work of a set of Wrenches. MADE IN FOUR SIZES.

**PATTERSON, GOTTFRIED & HUNTER, Limited**

Machinery, Metals, Hardware, Tools and Supplies,

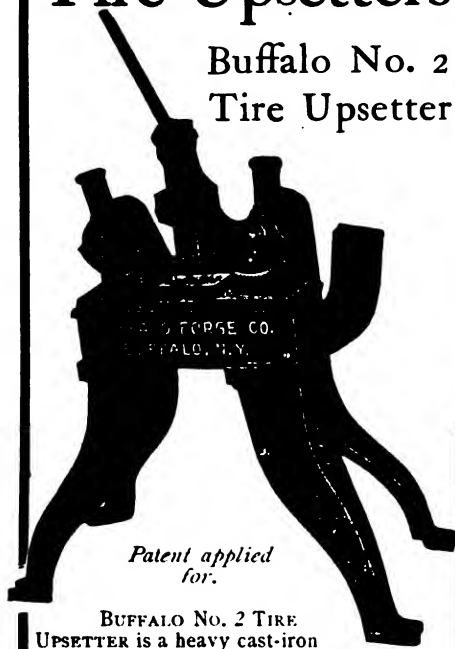
146-150 Center St., Cor. Walker St., N. Y.  
Telephone: 2540 Franklin

Blacksmith's  
Tools.



## Buffalo Tire Upsetters

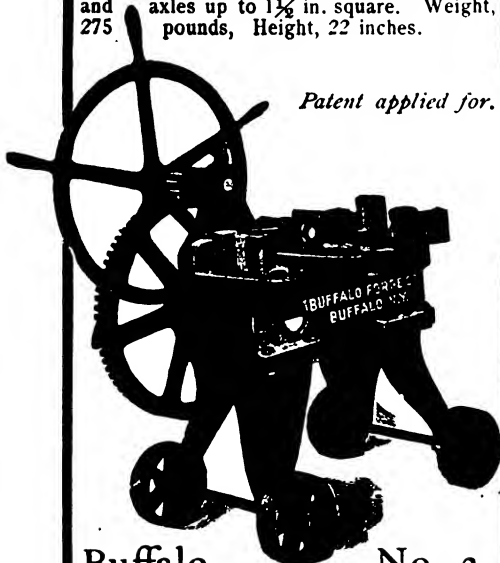
Buffalo No. 2  
Tire Upsetter



Patent applied  
for.

**BUFFALO No. 2 TIRE UPSETTER** is a heavy cast-iron machine. Grips are of crucible steel with machine cut teeth. The plunger seen between grips is brought down on work and prevents kinking or buckling. Upsets  $3 \times \frac{3}{4}$  in. tires, and axles up to  $1\frac{1}{2}$  in. square. Weight, 275 pounds, Height, 22 inches.

Patent applied for.



Buffalo No. 3  
Tire Upsetter

This is a powerful edge grip machine. Grips are faced with tool steel. Operates by a windlass and reduction gears. Upsets tires up to 6 in. wide. Capacity,  $6 \times \frac{1}{4}$  in. tires or  $2\frac{1}{2}$  in. axles. Removable cam between grips prevents kinking. Also provided with removable anvil piece for straight work. Weight, 900 pounds.

Write for circular describing  
both these machines.

**BUFFALO FORGE CO.,**  
BUFFALO, N. Y., U. S. A.  
The Canadian Buffalo Forge Co.,  
Montreal, Canada.

To satisfy your customer use the **H-CALKS**



Half worn, always sharp!

When New.

16 Beaver St.,

**H-CALK CO., INC.**  
New York City.

**Automobile Material and Tools**  
at half price and less. We have just bought all the material and tools from a local factory (who have discontinued the manufacture of automobiles). This is all first-class brand new stuff and if not satisfactory you can return.

29 Automobile Bodies, \$5.00 to \$15.00.  
5 Angle Iron Automobile Frames, \$5.00.  
46 Sta-Rite Spark Plugs, 75c.  
500 lbs. Short Pieces, High Grade Tool Steel, 10c. per lb.  
300 lbs. High Grade Welding Compound, 5c. per lb.  
50 lbs. Brazing Spelter, 20c.  
Aluminum Bronze Powder, 8c. per ounce.  
Gold Bronze Powder, 5c. per ounce.  
3, 2 H. P. Gasoline Engines at a Bargain, 2, 4 H. P., one 1 H. P., one, 10 H. P. Engine.  
300 feet  $1\frac{1}{4}$  in. Rubber Belt, 2c. per foot, 400 feet  $1\frac{1}{2}$  in. Rubber Belt, 3c. per foot, 200 feet 2 in. Rubber Belt, 4c. per foot.  
1,000 Taps at half price, 12 Small Taps, no two alike, 75c.  
12 Small Drills no two alike, 50c.  
12 assorted Files, no two alike, 75c.  
Stillson Pipe Wrenches, 6 in. 50c., 8 in. 60c., 10 in. 70c., 14 in. 89c.  
12 Malleable Hinge Pipe Vises, \$1.33.



Pipe Stocks with  $\frac{1}{8}$ ,  $\frac{3}{8}$ , and  $\frac{1}{2}$  Dies, \$1.95.  
Pipe Stocks with  $\frac{1}{4}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$  and 1 Dies, \$2.95.  
Pipe Stocks with  $\frac{1}{2}$ , 1,  $1\frac{1}{2}$  Dies, \$2.65.  
Best Pipe Taps on Reamers,  $\frac{1}{8}$ , 20c.,  $\frac{1}{4}$ , 25c.,  $\frac{3}{8}$ , 30c.,  $\frac{1}{2}$ , 35c.,  $\frac{3}{4}$ , 45c., 1 in., 60c.  
6,000 feet Iron Pipe,  $\frac{1}{8}$ ,  $\frac{1}{4}$ , or  $\frac{3}{8}$  in., 1 1/4c.,  $\frac{1}{2}$  in., 2 1/4c.,  $\frac{3}{4}$  in., 2 3/4c., 1 in., 3 1/4c.  
Do you want our Job Lot List?

**WESTERN TOOL CO.,**  
Lansing, Mich.

## Battery Trouble in a Gas Engine—

Like the notorious straw that broke the camel's back—is a little thing by itself, but it kills the engine's power.

And it is just one's luck for the break down to come at an important moment when delay is costly.

The "ACME 16" dry battery is "tailor made" to furnish "the spark." It is as near perfection as it is possible to make it. It is inspected at every stage of its making. If we knew how to make it better we would do so, and we keep one department busy trying to find out how. The "ACME 16" represents 18 years of dry battery experiment and experience.

We make other batteries for other uses. Write for Catalogue.

**The NUNGESSER ELECTRIC BATTERY CO.,**  
27 King Street,  
Cleveland,  
Ohio.

General Sales Office,  
128 W. Jackson Blvd.,  
CHICAGO, ILL.



We Manufacture  
**SHEARS  
AND  
PUNCHES**  
Hand or power, for  
shearing and punching  
plates, bars and angles.  
Send for Catalogue O.  
**BERTSCH & CO.**  
Cambridge City, Ind.

OUR NEW BOOKLET.

**"Do You Make  
Your Blacksmith  
Shop Pay."**

Together with sample of  
Laffitte Welding Plates—  
sent free upon receipt of  
your postal. Write today.

It tells how you can do  
hundreds of things that you  
cannot do now. . . .

THE  
**Phillips - Laffitte Co.,**  
PENNSYLVANIA BUILDING,  
Philadelphia.

## A TURN FOR THE BEST

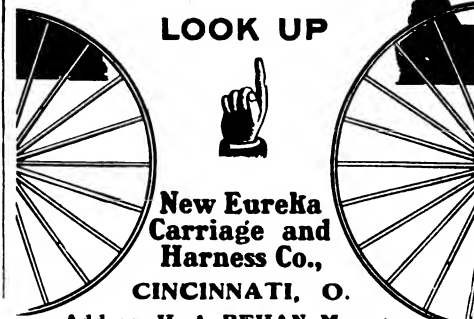
Every dealer turns profits his way when he takes on a line of

### EUREKA VEHICLES

Everything that goes into them is the best we can buy or make. This means that your customers will be pleased with them. You will get compliments instead of complaints.

Easy to sell because quality is high and prices are low. Profitable because quickly sold on liberal margin. Write to us and let us tell you.

Wheels in the white or finished complete, with or without rubber tires. Buggy Tops in all sizes, grades and prices.



LOOK UP

**New Eureka  
Carriage and  
Harness Co.,**  
CINCINNATI, O.

Address H. A. BEHAN, Manager.

# **The Williams Hardware Co.**

WHOLESALE

## **Heavy Hardware**

DEALERS IN

Iron and Steel, Horse-shoers' Supplies, Wagon Makers' Supplies, Carriage and Wagon Wood Stock.



DEALERS IN

Plow Shares and Plow Material, Wheels, Axles and Springs, Blacksmith Tools, Buggy Tops, Cushions and Dashes.

100-102-104 Second Ave. N., Minneapolis, Minn.

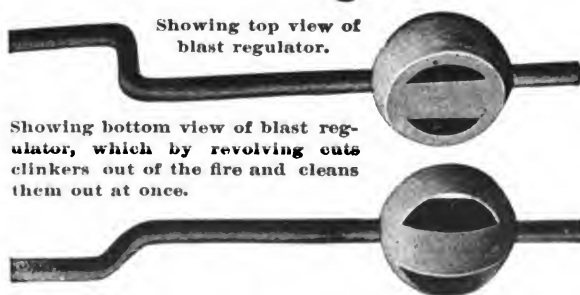


No. 2 tuyere iron is intended for large fires. Complete with one blast regulator.

Price, 6.00.

Showing top view of blast regulator.

Showing bottom view of blast regulator, which by revolving cuts clinkers out of the fire and cleans them out at once.



### **Something New**

#### **The Swenson Combined Fire Pot and Tuyere Iron.**

Patented June 13, 1905, and March 20, 1906.

Invented by a Blacksmith of twenty years' experience.

#### **Why this Tuyere Iron is Better than Others.**

No. 1. No lost time in breaking up fires or rebuilding. No more clinker poking. No more dirty heats. No more waste of fuel.

No. 2. This Tuyere will cut the clinkers out of your fire by simply turning the blast regulator, which requires but one second, therefore you can always have a clean fire ready for welding.

No. 3. For steel welding it has no equal. On this steel tires and axles can be welded quickly. Calks can be welded on steel shoes solid, in one heat, without burning the steel. Plow shares can be welded solid in two heats as easily as iron without burning the steel.

No. 4. This tuyere has a direct side and center blast. The blast regulator is made globular, which forces the side blast all around the blast regulator to the center blast, therefore forcing it into one continuous current of air, which increases the fire 100 per cent., and producing the hottest white heat that one can imagine, with just one-half the labor. The fire-pot can be reversed on the tuyere iron in any shape desired to accommodate the forge.

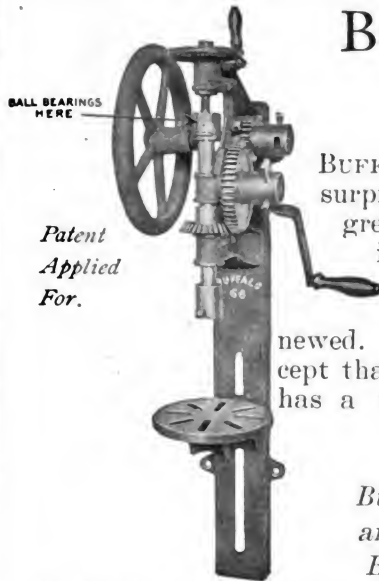
No. 5. This tuyere can be used for either hand or power. The pot is very durable and will withstand the very hottest fire. The tuyere has two changes of blast regulations.

## **THE WILLIAMS HARDWARE CO.,**

Agents for the United States.

## Buffalo Ball Bearing Drills

### 1906 PATTERNS



Buffalo No. 66 Ball Bearing Drill.

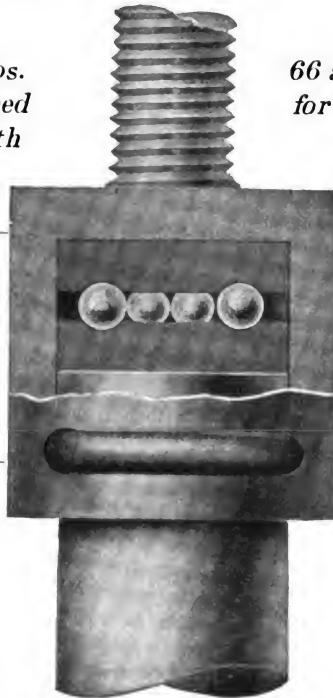
BUFFALO Nos. 66 and 68 are Ball Bearing Drills of surprising strength and capacity. They operate with greatest ease which is due to the splendid bearing construction. Wear is reduced to the greatest minimum possible. No brass connection nuts or soft metal bearings to be renewed. Both Drills are identical in construction except that No. 66 has an iron back and No. 68 has a wood back.



Buffalo No. 68 Ball Bearing Drill.

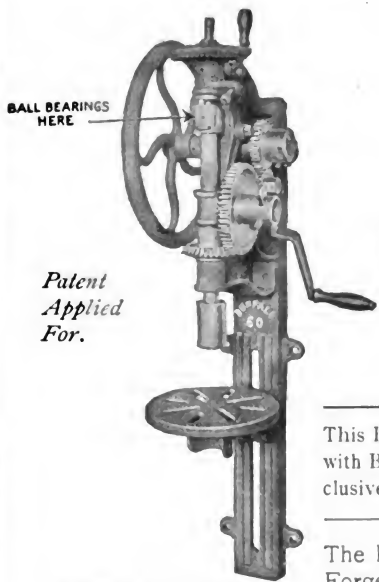
*Buffalo Nos. are designed Blacksmith*

*66 and 68 Drills for light general Work.*



This is an enlarged sectional view of Ball Bearing connection, with Ball Case, Disconnecting Key and Bearings. Used exclusively on Buffalo Nos. 60, 66 and 68 Drills.

The Ball Bearings are placed at the point of greatest friction, where the rapidly revolving Drill Spindle is connected to the Feed Screw, thereby reducing wear to the greatest minimum possible.



Buffalo No. 60 Ball Bearing Drill.

## BUFFALO 90 DRILL

LEVER FEED WITH THREE DISTINCT — FEATURES —

ARRANGED FOR POWER CONNECTION.

This Ball Bearing Cut shows the enlarged end of Feed Screw with Ball Case, Disconnecting Key and Bearings. Used exclusively on Buffalo 90 Drill.

The Lever Feed on Buffalo 90 Drill is made of Heavy Forged Steel. It can be instantly placed in position or removed at will. This Lever Feed is separate from Drill and complete in itself.



Buffalo No. 90 Ball Bearing Drill.

## BUFFALO 60 BALL BEARING DRILL.

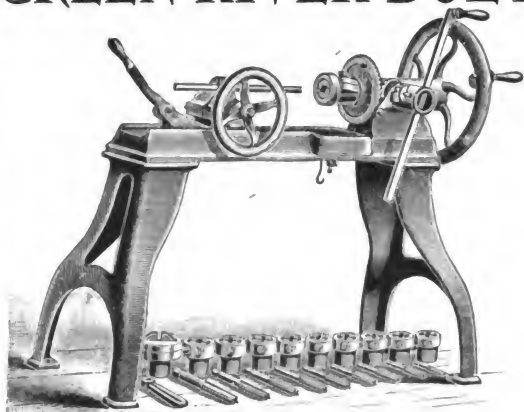
This is a Hand Drill of enormous capacity. Designed for Heavy Blacksmithing. Well and Durably Constructed. Is equipped with the same excellent Ball Bearing Connection as Buffalo Nos. 66 and 68, but Drill is of considerably larger capacity than either of these.

SEND FOR ILLUSTRATED CATALOGUE OF OUR EXTENSIVE LINE.

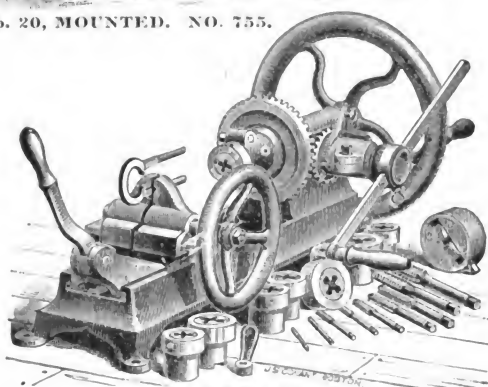
**Buffalo Forge Co., Buffalo, N. Y., U. S. A.**

CANADIAN BUFFALO FORGE CO., LTD., MONTREAL.

# GREEN RIVER BOLT CUTTERS<sup>A</sup> AND NUT TAPPERS<sup>N</sup>



No. 20, MOUNTED. NO. 755.



No. 20, FOR BENCH. NO. 754.

A Strong and Well-Constructed  
Machine at a "price" within the  
reach of every Blacksmith.

WILEY & RUSSELL MFG. COMPANY,  
GREENFIELD, Mass., U. S. A.

✂ Cut this out and send to us and we will mail you  
our new CATALOGUE NO. 33 D.

The WILEY & RUSSELL MFG. CO.,  
GREENFIELD, MASS.

Gentlemen:

Please mail me your new catalogue and  
price list No. 33 D, giving full description of your  
complete line of Blacksmiths and Carriage Makers  
Tools.

Name .....

Address .....

## POWER.

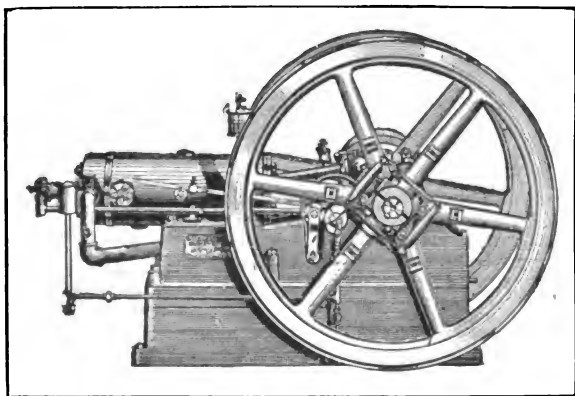
***Above everything else the shopman must have RELIABILITY.***

At his touch the power must be in motion.

It must not have the habit of getting out of order.

### DEPENDABLE SERVICE

Is just one of the distinguishing marks of I. H. C. Gasoline Engines. There's the unfailing response to every call, but there's also



power for any purpose. It will pay any power-user to know all about the I. H. C. Gas and Gasoline Engines before he buys.

They are made Horizontal, Stationary and Portable in 4, 6, 8, 10, 12 and 15 H.P., and Vertical in 2, 3, 4 and 5 H.P.

Begin the investigation now.

Write for free catalogue.

**THE INTERNATIONAL HARVESTER COMPANY OF AMERICA, (INCOR.)**  
No. 7 U Monroe Street, CHICAGO, ILL., U. S. A.





# Fact not Theory

Is what you are after. You want to know how to work steel at your forge. You desire the practical knowledge that will enable you to judge, forge, temper, weld, anneal and harden this most particular of metals. You want **Sound, Solid, Steel** talk, and you get it in

## The Scientific Steel Worker

By O. A. WESTOVER

A book written by a blacksmith and expert steel worker, and containing new methods of working steel, directions for manipulating the new steels; how to forge, harden and temper all kinds of tools; instructions for case hardening, annealing, welding and brazing. It contains recipes for welding and hardening compounds, twenty-four pages of mechanical tables for calculating iron, steel and angle iron, and many miscellaneous pointers contained in no other work.

The book is not written in "flowery" language, but is "meat" from cover to cover, and is easily understood. Exceptionally well bound in blue and red, and sent post-paid upon receipt of \$1.50. Address all orders to

**The American Blacksmith Co.**

P. O. Box 974.

BUFFALO, N. Y.

NORTHWESTERN  
HORSE NAILS  
PATENTED  
CHICAGO

FOR  
STRENGTH  
SAFETY  
AND  
QUALITY OF MATERIAL.

## Northwestern Horse Nails

### ARE THE BEST ALL AROUND

The most perfect in form and finish. Made of the best Swedish Iron. Will hold a shoe longer than any other nail made. Note the re-enforced point—makes it easiest to drive and the safest to use.

UNION HORSE NAIL CO., CHICAGO, ILL.

# A GUARANTEED HOOF CURE

## Mr. Blacksmith

Would you be interested in learning how to pick up a good many extra dollars in your business with very little extra work? Would you like to increase your business—make it bigger—make more money and make more satisfied customers? You can do it and do it easily with

## O. K. Hoof Remedy

Hundreds of blacksmiths are doing it today and so can you. We want you to sell and recommend O. K. Hoof Remedy to your trade, and this is how we suggest you do it: First, we want you to test it. We want you to KNOW from actual experience what it will do so that you will have confidence in it—so that you will be enthusiastic over its merit. We will stand the risk if it does not do what we claim for it. For example, we offer \$100.00 for any case of Contracted Feet, Corns, Dry, Cracked, Brittle Hoofs, Scratches, Sores, Thrush and Quarter Cracks it fails to cure except in founder when used as directed. We do more—we say to you, and you can say to your customers, back goes your money if it fails. You take no risk. Send 15¢ for trial can and get our special liberal terms to blacksmiths. We want you to handle this remedy in your locality. You can sell lots of it and make money. Send today and "clinch" the agency.

THE O. K. STOCK FOOD CO.  
Room 450 Monon Building  
CHICAGO

O.K. HOOF REMEDY  
KEEPS HOOFS O.K.



# SEARS IMPROVED PUNCH AND SHEARS

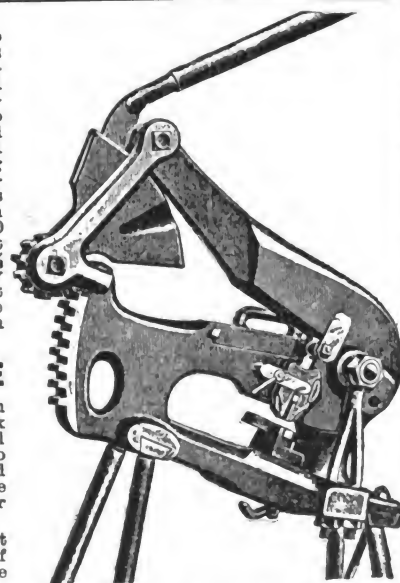
WE herewith present to the readers of THE AMERICAN BLACKSMITH our improved Punch and Shears, a machine that we guarantee to be the **most powerful** and **handy** of any punch and shear on earth for jobbing and wagon shops. This machine has no equal, as it has a power of 88 tons on punch with a man weighing 150 pounds on a 4-foot lever. It will punch a  $\frac{3}{8}$  hole in  $\frac{1}{2}$  iron, will shear iron  $\frac{3}{8}$  by 4 inches wide, and will cut off 1 inch round iron. The above work is done with ease.

## OUR GUARANTEE

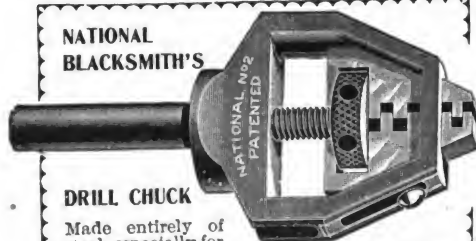
We guarantee our Punch and Shears to do the work as stated above, and will give \$200.00 to anyone who will show a Punch and Shear that will compete with ours in a jobbing or wagon shop.

We are the only firm that advertises the length of lever it requires to do the work of these machines, and would suggest before buying a Punch and Shears to find out the length of lever it requires to do the work advertised.

SEND FOR CIRCULARS AND PRICE LIST



**GEO. SEARS & SON**  
ONSLOW, IOWA

NATIONAL  
BLACKSMITH'S**DRILL CHUCK**

Made entirely of steel, especially for blacksmithing and carriage work. Positive, strong and self-cleaning. Casts no shadows. Will save cost over other chucks in the saving of time. Money refunded if not as represented. Ask your jobber for it or send direct for prices and circulars. The best is the cheapest.

THE ONEIDA NATIONAL CHUCK CO.,  
Oneida, N. Y., U. S. A.

## "CHICAGO"

### EMERY WHEELS CUT QUICK

A wheel that will do the work in one-fourth to one-half less time is by far the cheapest in the long run. A wheel that will save only one hour per day during your busy season would pay for itself in full.



## "CHICAGO"

### WHEELS SAVE TIME

They're made of stuff that cuts

Emery Wheels, Glue, Emery, Polishing Wheels, Grinding Machinery  
136 Page Catalogue for the Asking

*Chicago Wheel & Mfg. Co.*

42 W. RANDOLPH ST.  
CHICAGO, U. S. A.

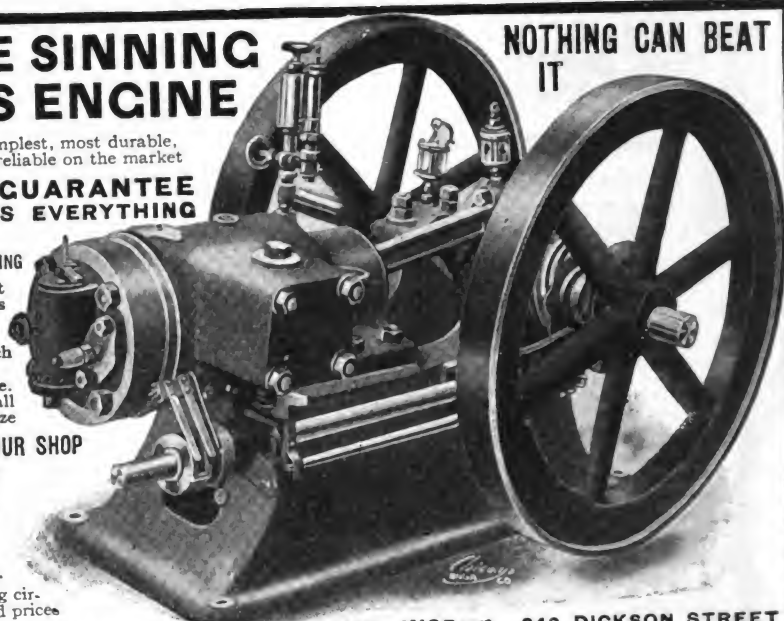
## THE SINNING GAS ENGINE

Is the simplest, most durable, and most reliable on the market  
**OUR GUARANTEE  
COVERS EVERYTHING**

**THE SINNING**  
is cheapest to run, has few working parts, all of which are interchangeable. Bearings all hard bronze

**EQUIP YOUR SHOP**  
with the  
**VERY  
BEST**

Write for  
interesting cir-  
culars and prices



**NOTHING CAN BEAT  
IT**

**THE CHARLES SINNING MACHINE WORKS**

242 DICKSON STREET  
ST. LOUIS, MO.

PAT'D APRIL 29th, 1902.

## THE REYNOLDS AXLE GAUGE

Simple, accurate and durable. Your equipment not complete without one. Give this Gauge close examination. Best material and workmanship guaranteed. Beam is the very best tubing, one inch in diameter, six feet long. Pivot arm, gauge plate and indicator all of solid brass. Self adjustable to any length or size of axle.

This Superior gauge is sold by dealers everywhere and always gives perfect satisfaction.

If your dealer cannot supply you write to us for our liberal thirty day free trial offer.

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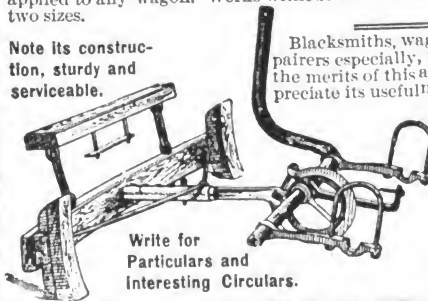
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Note its construction, sturdy and serviceable.

Blacksmiths, wagon and buggy repairers especially, will see at a glance the merits of this axle cutter and appreciate its usefulness.

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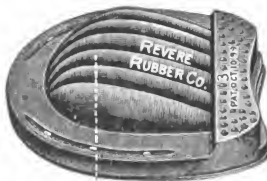
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Cutter**

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**See That Cushion?**

It fills with air at each step. That's what breaks concussion. That's what prevents slipping. That's what keeps the foot healthy. That's what cures lameness.

Twelve Different Styles



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**NO  
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CHEAPEST  
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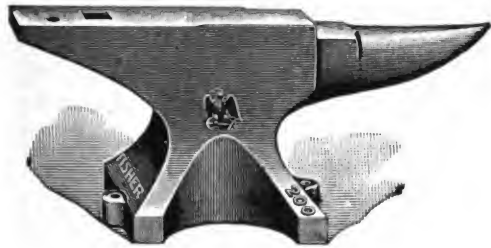


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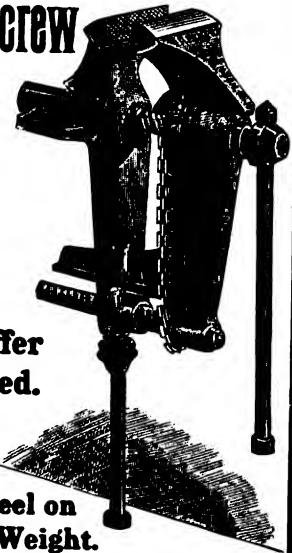
**EAGLE ANVIL WORKS, TRENTON, NEW JERSEY.**

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**ANVILS AND VISES OF QUALITY****"Fisher" Double Screw Parallel Leg Vise**

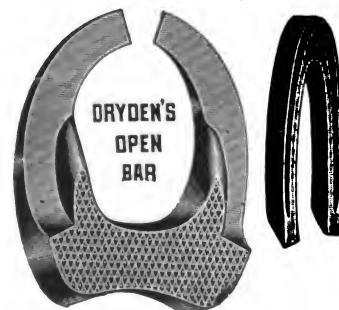
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**We make Eighteen  
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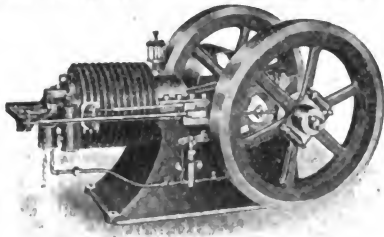
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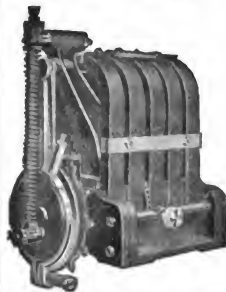
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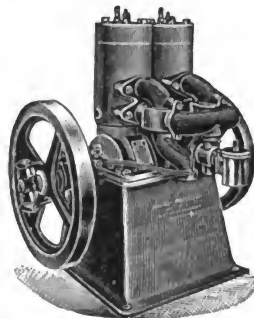


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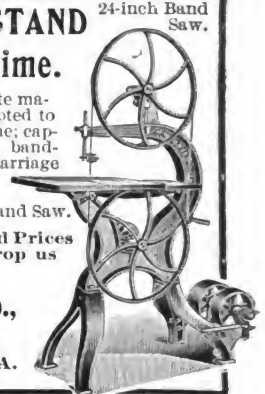
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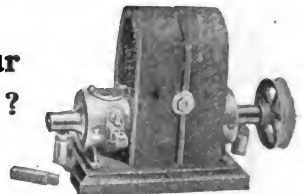
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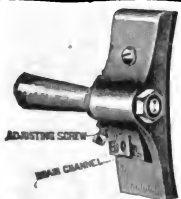
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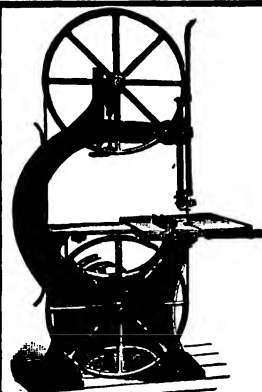
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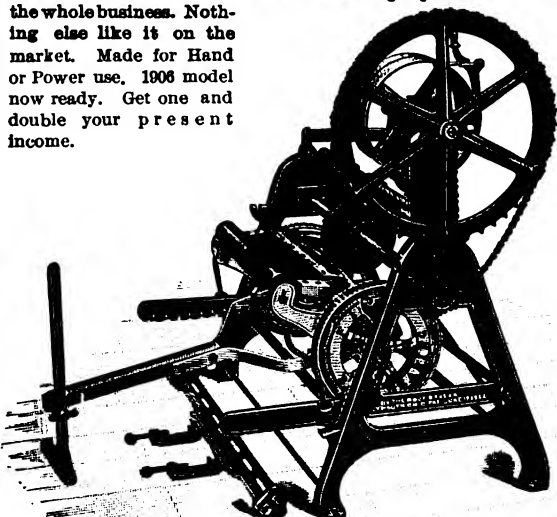
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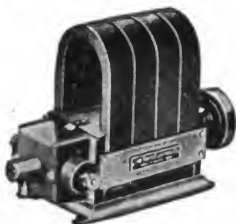
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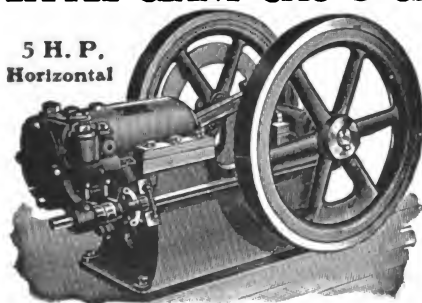


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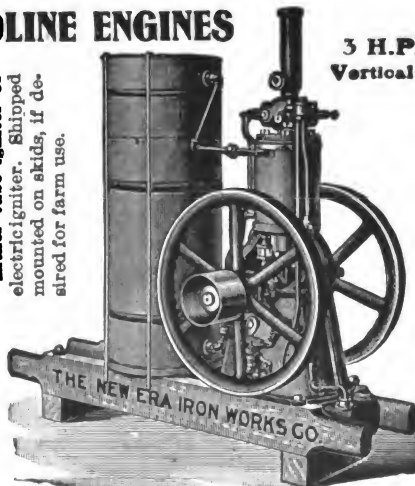
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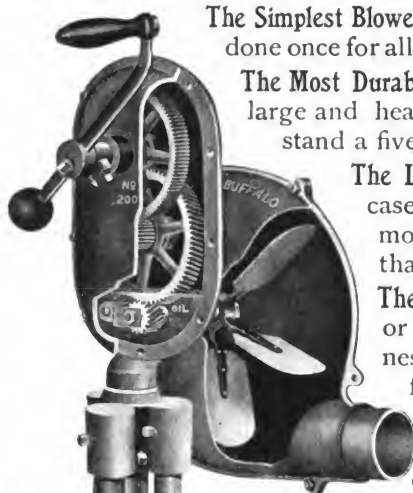
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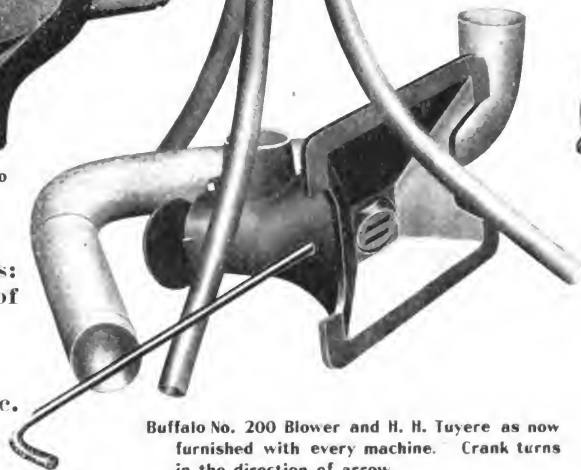


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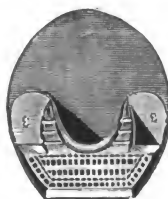
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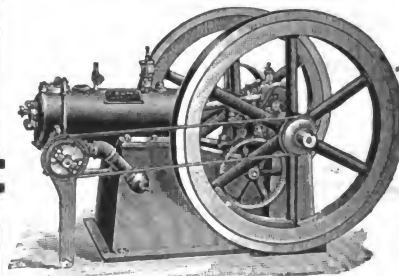
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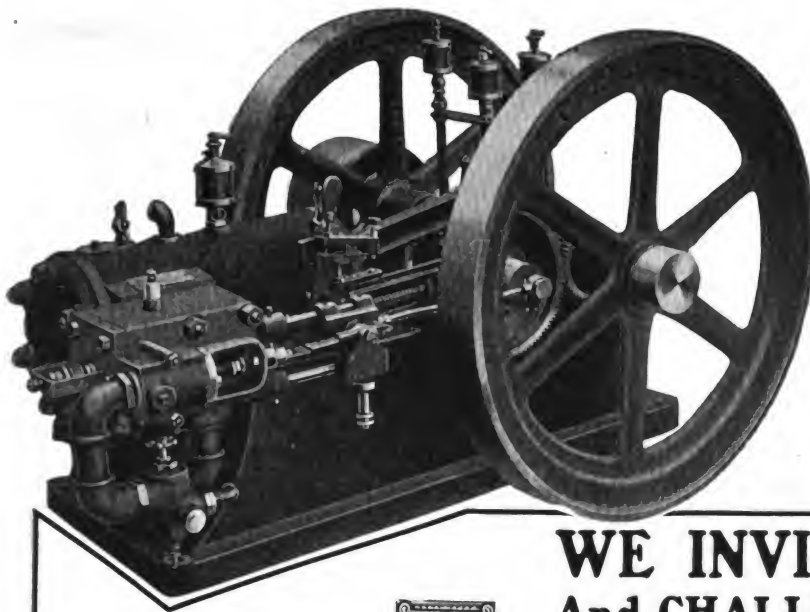
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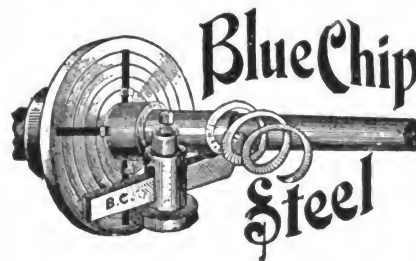
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PROMPT SHIPMENTS. Five or more, one order, you can deduct 5% per set as freight allowance. Write for catalogue. We manufacture wheels with Steel or Rubber Tire on. 3-4 to 4 inch tread. Buggy Gears with wheels and shaft all ready for body, \$15.50.

The A. Boob Wheel Co., Cincinnati, O., U. S. A.

## Morse Twist Drill and Machine Co.,

New Bedford, Mass., U. S. A.

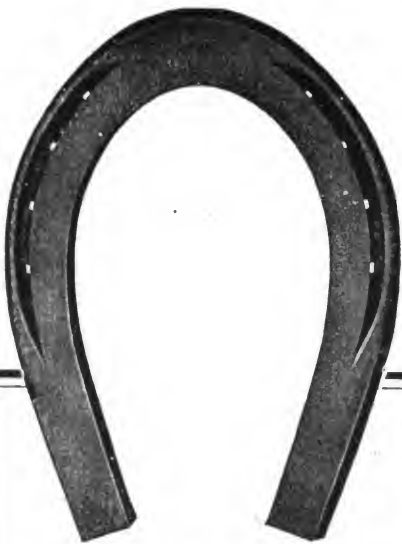
Bit Stock Taper

REAMERS.



Taper 1 inch to the foot. Diameter at large end of flutes is 1/16 inch larger than nominal size.

These Reamers are furnished with straight round shanks 1/2 inch diameter, 2 inches long, if so desired, at special prices.



### WHEN YOU BUY HORSE SHOES

Is it not preferable to make your selection from the most complete line and the best shoes on the market?

### UNITED STATES HORSE SHOES

"In a Class by Themselves"

OUR Illustrated Catalogue shows all sizes and patterns. The book is free. We will gladly send a copy to your address. Write today

We are giving away a handsome souvenir stick pin to every smith who sends his name and address. Did you get one? Don't wait until they are gone. Write today.

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— ARE SOLD BY —  
LEADING JOBBERS  
EVERYWHERE

## United States Horse Shoe Co.

ROLLING MILLS  
and FACTORY

Erie, Pa.

## BUFFALO PUNCHES AND SHEARS

MADE OF SOLID ARMOR  
PLATE STEEL

SOLID STRONG  
INDESTRUCTIBLE



*Patent  
Applied For.*

### Buffalo Giant No. 5 Punch and Shear

Punches  $\frac{3}{4}$ -inch holes in  $\frac{1}{2}$ -inch plate. Shears bar iron  $6 \times \frac{5}{8}$ -inch. Depth of throat 7 inches. Height 55 inches. Weight 850 lbs. Weight without wheels, 725 lbs. A high power machine especially designed for

Blacksmith Shops, Boiler Shops,  
Structural Steel Shops.

### Buffalo Combined Punch and Shear No. 3 B

Punches  $\frac{3}{8}$ -inch holes in  $\frac{3}{8}$ -inch plate. Shears bars  $\frac{3}{8} \times 3$ -in. or  $\frac{1}{2}$ -in. round. Depth throat of punch,  $4\frac{1}{4}$ -inch. Length shear jaws,  $4\frac{1}{4}$ -inch. Height floor to die, 30 inches. Height over all, 46 inches. Weight 345 pounds.



*Patent Applied For.*



*Patent  
Applied  
For.*

### Buffalo Punch, Shear and Bar Cutter No. 4 $\frac{1}{2}$

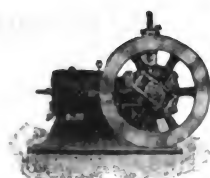
Punches  $\frac{1}{2}$ -inch holes in  $\frac{3}{8}$ -inch plate. Shears plate of any width and up to No. 8 gauge. Bar cutter cuts off round bar from  $\frac{1}{4}$ -inch to 6, and flat bar  $2\frac{1}{2} \times \frac{3}{8}$ -inch. Height over all, 55 inches. Weight, 460 lbs.

If you are interested we will send you our complete illustrated Catalogue on Buffalo Punches and Shears.

## BUFFALO FORGE COMPANY,

BUFFALO, N. Y., U. S. A.

CANADIAN BUFFALO FORGE CO., Ltd., MONTREAL, CANADA.



The 1906  
**CUSHMAN**  
3 H. P. 150 lbs.  
6 H. P. 225 lbs.  
Simple, Durable  
Free Catalogue.  
CUSHMAN MOTOR CO.,  
Lincoln, Neb

**TRIMMINGS FOR EVERYTHING ON WHEELS**

Wholesale Manufacturers  
Export Work our Specialty.  
INDIANA TOP & VEHICLE CO.,  
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Write For Catalogue and Prices.  
TOPS FROM \$1.40 UP

**THROW OUT THAT BATTERY**

**Apple Automatic Sparker**

That causes so much trouble on your gas engine and install an **APPLE AUTO-MATIC SPARKER**. No switches, no belts, no batteries for starting or running. A dynamo that produces a strong, steady current and furnishes a fat, hot spark at all times. Write for information.

**THE DAYTON ELECTRICAL MFG. CO.,**  
152 St. Clair St. DAYTON, OHIO.

**RELIABLE POWER**

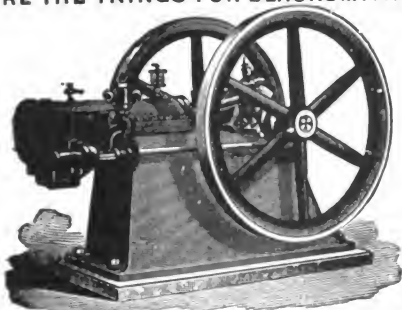
New model and Michigan gasoline engines for blacksmith and machine shop work. Every part guaranteed and illustrated in our catalogue, which is sent free to those interested.

We make a very favorable price on the first engine in any locality and the best of terms for agents who sell and advertise our engines.

Our book called "Proof Positive" tells how our engines are being used and where we have replaced other engines with ours. 2 to 6 horse power. Get catalogue today. Nothing like them on the market.

**The Nation Engineering Co., Saginaw, Mich.**

**COLUMBUS GASOLINE ENGINES**  
ARE THE THINGS FOR BLACKSMITHS



Send for Catalogue 33, Stating Horse Power You Need.

**COLUMBUS MACHINE COMPANY**  
Columbus, Ohio,

The prices we quote you on our **PAINTS, COLORS and VARNISHES** may save you money as it has done for others. . . . A postal will do. Write us.

**BUCKEYE PAINT & VARNISH CO.**  
TOLEDO, OHIO.

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**RUBBER TIRED RUNABOUT, \$36.00**

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**Lennox Gasoline Engines**  
MADE IN ALL SIZES.

Built especially for Blacksmith shop power. It means money in your pocket to find out about our engines before placing your order.

WRITE AT ONCE FOR NEW FREE CATALOGUE.

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**\$100 The New Pierce Gasoline Motor**  
IS A WONDER.

It will develop more power on less fuel than any other make in the world.....

Built on modern lines and up to the very latest practice; made from the best material, and with ordinary care will last a life time.

We have been building Gasoline Motors for over twenty years. More than 12,000 **PIERCE MOTORS** are in use in all parts of the world. We know how to, and do, build them right, in fact, we

**Guarantee Them to Give Satisfaction.**  
If they do not, send them back and we will refund your money in full. . . .

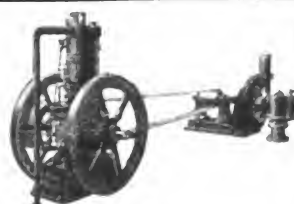
The **PIERCE MOTORS** are the best in the world and cost less than the poorest. We guarantee them against defective material for life. If you want power for any purpose, write for our printed matter, stating your needs. We also build other sizes up to 100 H. P., also Marine Motors, Launches and Auto Boats. Be sure and address

**PIERCE ENGINE COMPANY, - Dept. 12, Racine, Wis.**  
3 1-2 Actual Horse Power.

**Hathorn's Hard-hitting Helve Hammer.**

STROKE adjustable while running.

Ask your dealer or write to  
**HATHORN FOUNDRY & MACHINE CO.**  
GRINNELL, IOWA.



To irrigate, water stock or for any pumping, the best outfit and cheapest to operate is the  
**Fairbanks-Morse Gasoline Engine & Pumps**

Awarded Gold Medals at World's Fair, 1904  
Cut out complete advertisement and send to

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Please send me illustrated Catalogue No. X 487 Gasoline Engines. I may want..... H. P.

Engine to run.....

Name..... Street No.....

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**DEATH TO HEAVES! NEWTON'S**  
  
 GUARANTEED  
 Heave, Cough, Dis-  
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 tion Cure will effect a  
 permanent cure for the  
 ailments named. Recom-  
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 and owners. Every drug-  
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 can get it.  
 Send for Booklet.  
 \$1.00 per can, of dealers, or express prepaid.  
**THE NEWTON REMEDY CO., TOLEDO, OHIO.**

**CLARK'S** DOUBLE ACTION 8 FT. CORN  
 NO MORE USE FOR FLOW  
 SEND FOR CIRCULARS TOTAL CUTAWAY HARROW CO  
 HIGGANUM CORN U.S.A.  
**HARROW**

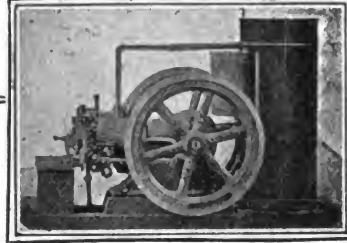
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**No. 92**  
 Double Jet Torch  
 For Brazing Wires  
 on Rubber Tires  
**GUARANTEED**  
 Jobbers sell at  
 Factory Prices,  
 \$4.50 net

**THE TURNER BRASS WORKS**  
 63 No. Franklin St. CHICAGO, ILL.

**SPAVINOFF CURES**  
  
 Spavin, Ringbone, Grease  
 Heel, Sweeney, Windgall,  
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 \$1.00 per Box, by Mail. For HORSES AND CATTLE.

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**Vehicle and Automobile Bows**

  
**Designed for the Blacksmith. Our 4 H. P. Engine**  
 Fills every shop requirement and is always ready for  
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 owners. Simple, strong, substantial. Best material and  
 finest workmanship. Write for our Catalogue. Sent free for  
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**THE "BUSH" Low-down Handy Wagon**  
 WITH 4-IN. TIRE STEEL WHEELS  
 Our wagons are well ironed throughout—wheels made with  
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We make any size wheels to fit any skein.  
 We manufacture a complete line of metal wheels for corn  
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**WRITE TO C. BUSH, QUINCY, ILL:**  
 (MENTION THIS PAPER.)

**THE GENEVA**  
**Handy Farm Wagon**  
 THE BEST METAL WHEEL WAGON MADE.

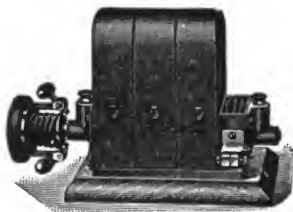


**All Goods Guaranteed**

Pressed steel wheels, any height and width tire, interchange-  
 able hubs. Gears of selected stock, thoroughly ironed. Made  
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WE ARE ESTABLISHING ONE AGENT IN EVERY TOWN.  
 Send for Descriptive Circulars to

**Geneva Metal Wheel Co.**  
 GENEVA, OHIO



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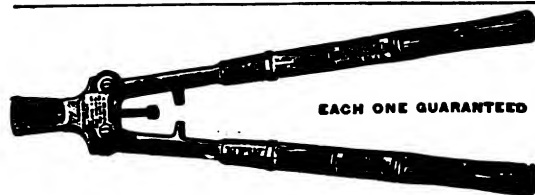
*Fires your gas or gasoline engine without the aid of batteries.*

It is better and more durable than any Dynamo. Its Governor regulates the speed  
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**GUARANTEED. AGENTS WANTED.**

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EACH ONE GUARANTEED

## BOLT CLIPPERS

**CHAMBERS BROS. CO.,**

N. Fifty-Second Street,  
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## Solid Tire Applying Machines.

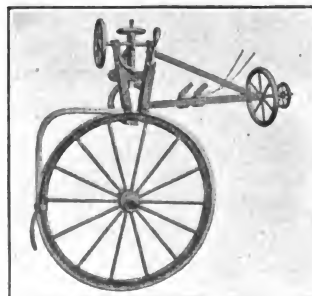
For applying internal and side  
**WIRE TIRES.**

Special Machines built to order.

Write for new, illustrated Catalogue, just  
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**NELSON AND LE MOON,**

105-107 SO. JEFFERSON ST.,  
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The Original Internal Wire Applying Machine.

**HAND  
 FORGED**



**BUTCHER  
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**A GOOD  
 SIDE-LINE**

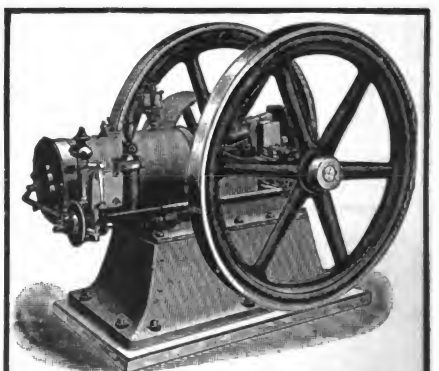
Hundreds of blacksmiths are making large  
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 fully warranted. Made of Sanderson Steel.  
 Round or riveted. All sizes from 5 to 8 inch.  
 Handles ready to put on, 1c each.

**\$ .15 EACH  
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Hand Forged Razors, ready to use, 40 cents each.  
 Pocket Knife Handles in variety, 10 cents each. Send for sample.

**WOODWORTH KNIFE WORKS, NUNDA, NEW YORK**

  
**BICKNELL'S**  
 COMBINATION  
 JOINTER, SAW  
 AND SPECIAL  
 MACHINE.  
 Acknowledged  
 the Best.  
 In use in every  
 State.  
 For Sale  
 by your  
 Jobber  
**The Bicknell Mfg. & Supply Co.,**  
 Manufacturers of Iron and Wood Working  
 MACHINERY,  
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**HIGHEST AWARD--GOLD MEDAL**

**ST. LOUIS EXPOSITION**

FOR

**Efficiency  
 Durability  
 Simplicity**

Write for Catalogue and Prices.

**BAY STATE GAS ENGINE CO.,**

48 Washington St., North,  
 BOSTON, MASS.



*Little Giant.***A SIGN OF  
Strength and Quality****The "Little Giant" Drill Press**

Is a strong, service-able,

compact  
and thoroughly  
well made machine  
and like all other"Little  
Giant"  
machines,  
is **Fully**  
**Guaran-**  
**teed to**  
**give per-**  
**fect sat-**  
**isfaction****GENERAL DIMENSIONS**Drills to one inch diameter hole. Drills to center of 14-inch circle. Swinging Table (either side). Easily adjusted to height. Spindle is made of steel and has TOOL STEEL SET SCREW hardened and tempered. Spindles are made to receive  $\frac{1}{2}$  inch or  $\frac{1}{4}$  Shanked Twist Drills.**Leading Dealers**  
**Everywhere**  
**carry "Little Giant"**  
**Machines.**Write for our complete  
Catalogue—Free.A complete line of  
**Drills, Vises, Bolt-**  
**headers, Swage**  
**Blocks, Mandrels**  
Fully Illustrated and  
Described.Send name and address  
today for Catalogue.**B. B. NOYES & CO.**

Greenfield, Mass., U. S. A.

For  
Gas or GasolineSizes  
 $2\frac{1}{2}$  to 30 H. P.**Greendale Gas Engines.****THE BEST POWER**

For Blacksmith Shops.

Also adopted for Electric

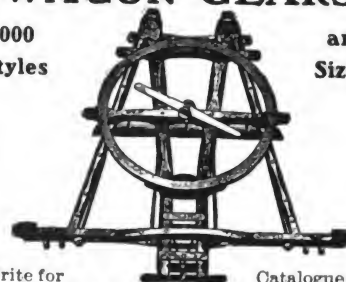
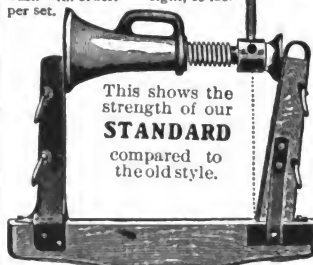
Lighting.

Write for Catalogue A. B.

**GREENDALE GAS ENGINE CO.,**  
WORCESTER, MASS.**PATENTS** **PROTECT**  
**YOUR**  
**IDEAS**Send for Inventor's Primer. Consultation  
free. Established 1864.**MILO B. STEVENS & CO.,**

852-14th St., Washington, D. C.

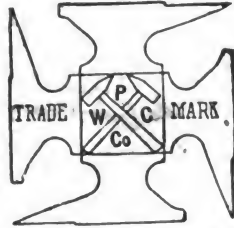
Branches at CHICAGO, CLEVELAND, DETROIT.

**WAGON GEARS**1,000  
Stylesand  
SizesWrite for  
**THE AKRON SELLE CO.,**  
Akron, Ohio.**THE "VICTOR"**The secret of "VICTOR" popularity—a blade of first quality, finest  
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No. 1, 3 in. wide, 14 in. high  
" 2, 3  $\frac{1}{4}$  " 14 "  
" 3, 3  $\frac{1}{4}$  " 10 "  
Price, \$1.65 per set of 4 stks  
Cash with order. Weight, 16 lbs.  
per set.This shows the  
strength of our  
**STANDARD**  
compared to  
the old style.**The Bruce Malleable Wagon Standard**This Malleable Iron Bolster Standard has been tested thoroughly, and we  
guarantee it strictly as represented.Anyone familiar with the farm wagon will readily see the great advantages of  
the Malleable Iron Bolster Standard over the old style.1. Made of the best grade malleable iron. It has been thoroughly tested by  
factories and wagon makers and pronounced a great success.2. It is attached to bolster by means of two bolts passing through bolster  
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perfectly solid, and at the same time strengthening end of bolster, which in old  
style is weakened by mortise.3. The Malleable Iron Standard has a 3 x 2 in. face at base, which prevents  
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to put on wood stake. Adapted to new and repair work. The price will justify  
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DEALERS EVERYWHERE.****IT RINGS  
LIKE A BELL.**

**YOU WILL NEVER FAIL**

*To Make a Strong, Clean Weld If You  
Use Perfection Welding Compound.*

We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



Perfection Welding Compound will do the trick quickly and neatly. It makes a stronger weld than any other compound manufactured, as proven by the tests it has undergone. Send for free sample.

PRICE CONSISTENT WITH QUALITY.  
PERFECTION WELDING COMPOUND CO., SCRANTON, PA.

**DOES IT PAY**

TO STOCK UP WITH  
LOW PRICED TOOLS?

**STERLING**

**HACK SAW BLADES**

ARE NOT THE LOWEST IN PRICE BUT THEY ARE  
**THE CHEAPEST** FOR YOU FOR YOUR CUSTOMERS.

**BECAUSE**, MADE FROM THE HIGHEST GRADE  
OF STEEL THAT MONEY CAN BUY. MADE WIDE AND HEAVY.  
*There's a purpose in this.* *It costs us money.*

COSTS YOU NO MORE THAN LIGHTER THINNER BLADES.

DIAMOND SAW & STAMPING WORKS,  
BUFFALO, N.Y. U.S.A.

CENTER POINT, Ind., Mar. 16, 1906.

Buffalo Forge Co.,  
Buffalo, N. Y.

Gentlemen:

We have two No 200 Buffalo blowers in our shop, and we find them all we ask for. I don't think there is any better. We call Buffalo tools A No. 1.

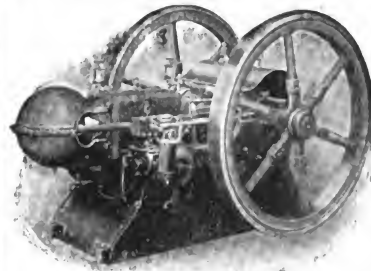
If these few lines will do you any good, you are welcome to use them anywhere.

Yours truly,

Benfer & Brooks,  
per Brooks.

**LIGHTNING BALANCED**

**GAS and \* \* \*  
GASOLINE ENGINES**



**Are Especially  
Suited for  
Blacksmith Shop  
Power.**

Write for Free Catalogue.

**KANSAS CITY HAY PRESS CO.,**

482 Mill Street,

KANSAS CITY, MO.

**INVESTIGATE THE****Hercules Hydraulic**

**Before  
You  
Buy a  
Tire Setter**



**National Machine Co.**  
KEOKUK, IA.

**Henderson Hand Power TIRE SETTERS**

Set Tires Cold.  
Keep the Dish right  
Tighten Wood Work  
Pull Broken Spokes  
Jump in New Spokes  
Are Money Makers



**Standard Tire Setter Co.**  
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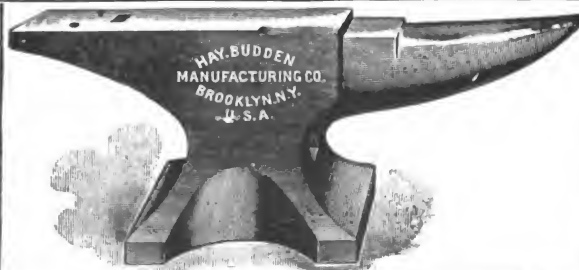
**HAY-BUDDEN SOLID WROUGHT ANVILS**

**The Gold Medal Anvil  
Highest Award**

OMAHA, 1898 PAN-AMERICAN, 1901

Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS.



**OVER 100,000 IN USE**

**WARRANTED**

Experience has proved their worth and demonstrated that "HAY-BUDDEN" Anvils are Superior in Quality, Form and Finish to any on the Market.

**HAY-BUDDEN MFG. CO., BROOKLYN, N. Y.**

VOLUME 5

THE

NUMBER 9

# AMERICAN BLACKSMITH

BUFFALO  
N.Y. · U.S.A.

A Practical Journal of Blacksmithing and Wagonmaking

JUNE, 1906

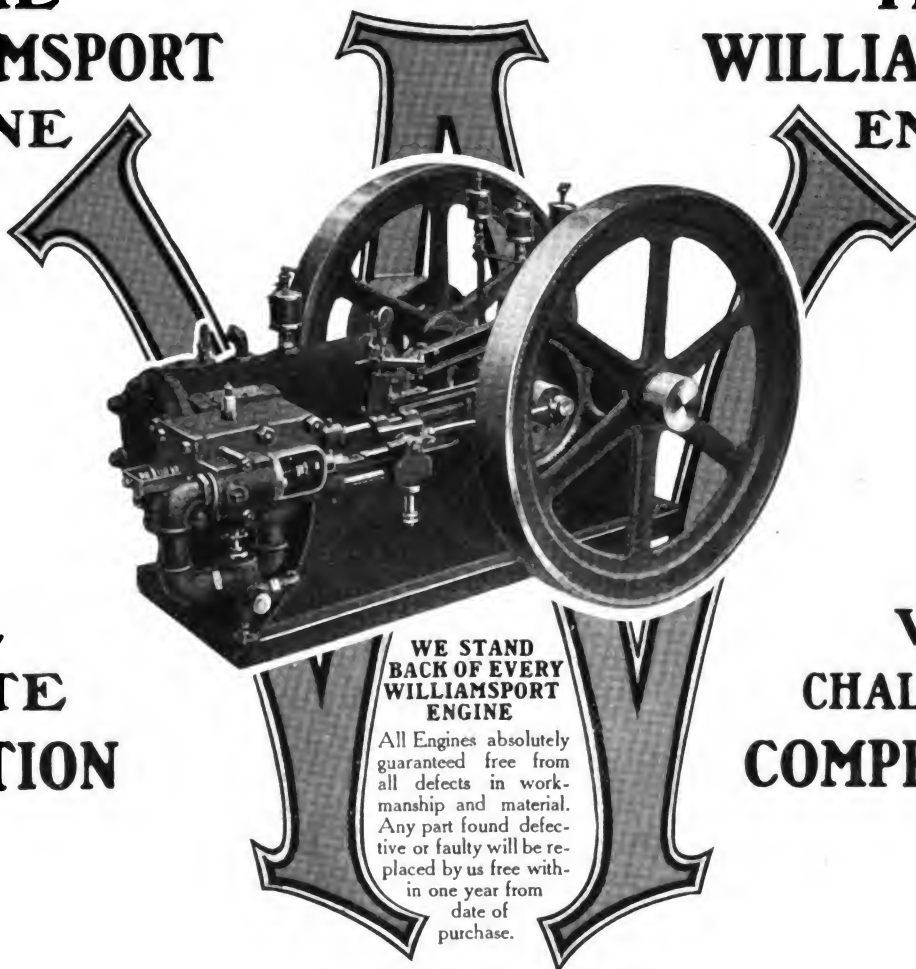
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ENGINE

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INSPECTION

WE  
CHALLENGE  
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WE STAND  
BACK OF EVERY  
WILLIAMSPORT  
ENGINE

All Engines absolutely  
guaranteed free from  
all defects in work-  
manship and material.  
Any part found defec-  
tive or faulty will be re-  
placed by us free with-  
in one year from  
date of  
purchase.

## Williamsport Gas and Gasoline Engines

Are sold strictly upon their merits. We give the shop-owner an engine of finest quality, constructed of the very best material and by the most skilled mechanics. Especially noted for its simplicity, durability, ease of operation and beauty of design. Our engines meet every shop requirement. Always ready to run, no engineer required, no increase in insurance by their use. Built in all sizes from 2 to 25 horse power. Our "Giant" 4 H.P. engine shown above is the very best on the market for the user of small power. Write for full particulars.

Illustrated Catalogue sent free. Write for it today.

**WILLIAMSPORT GAS ENGINE COMPANY,**  
WILLIAMSPORT, PA.

WHEN the "Silver" tools for Carriage Makers and Blacksmiths get busy they do their work so neatly, so accurately and so economically that every new user advertises us through pure delight over his discovery of their superior merits. Every well-informed, up-to-date mechanic knows

## The Economy of Perfect Tools

And our tools are "perfect" when it comes to actual results. Some advertisers try to hide the poor qualities of their inferior machines by mere force of figures and space. They deliver great broadsides through the magazines.

They sell goods—of course they do, but—*their customers do not advertise them.* When people get burned they stay away from the fire. But OUR customers advertise us because they get QUALITY—genuine, down-right quality. That's what counts.

*We haven't been mixing expert brains with the best materials all these years for nothing.* It counts a whole lot.

If YOU are desirous of the very best labor- and money-saving things in the carriage making or blacksmith lines,

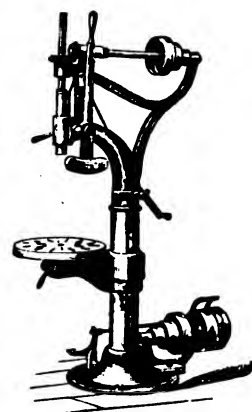
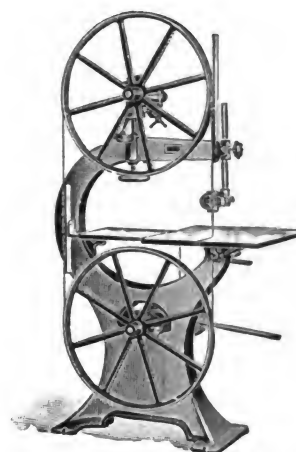
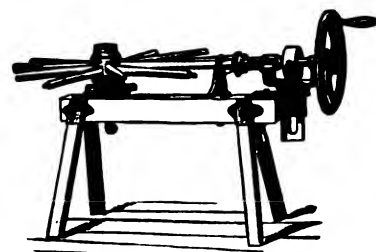
Send for Booklet, "Carriage Maker and Blacksmith Tools."

It will come by return mail. It tells all about Hub-boring Machines, Hollow Augurs, Tenon Machines, Band Saws, Portable Forges, Swing, Post and Bench Drills, gives prices, weights of different sizes, etc., and illustrates fully and freely.



Fig. 925.

SILVER'S PORTABLE FORGE.

Fig. 850.  
SILVER'S  
BASE DRILL.Fig. 822.  
SILVER'S POWER  
BAND SAW.Fig. 718.  
SPOKE TENON MACHINE.

MANUFACTURED BY

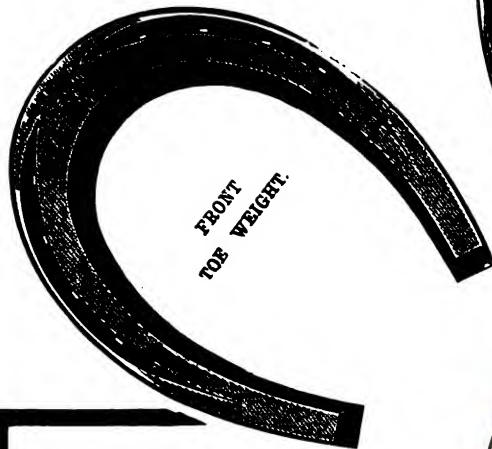
# The Silver Mfg. Co.

365 BROADWAY,

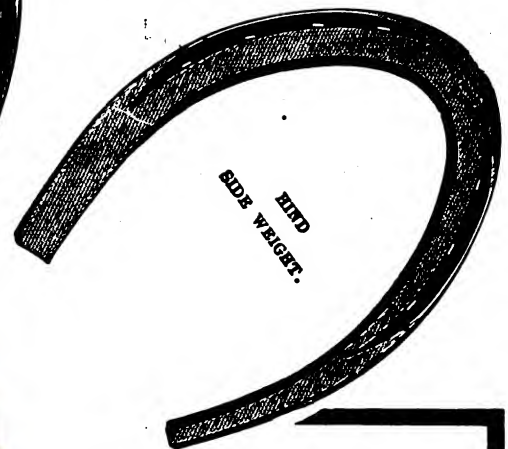
Salem, - Ohio.



★PERKINS★  
HORSE SHOES  
AND  
TOE CALKS  
THE STAR BRAND



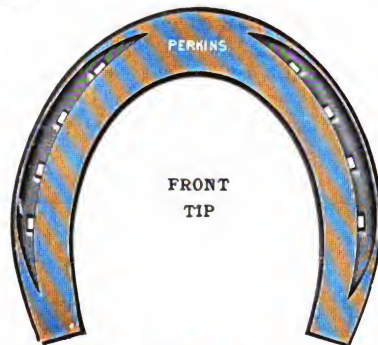
★PERKINS★  
HORSE SHOES  
AND  
TOE CALKS  
The SUPERIOR Kind



**PERKINS  
SHOES**

Have more points of superiority than any other make. An up-to-date shoe for up-to-date Blacksmiths. .

OUR  
Complete  
Catalogue  
SENT FREE.  
Write Today.



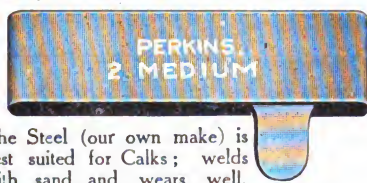
**PERKINS  
SHOES**

Are acknowledged by all users to have no equal. Made in all Styles and Sizes. Sold at Reasonable Prices.

Send  
for Samples New  
Pattern Front  
Extra Light and Light.  
Free for asking.

**PERKINS**

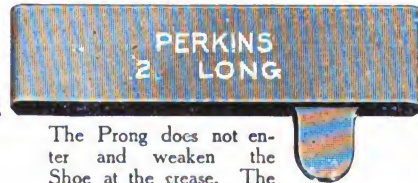
Made in Medium and Long, both blunt and sharp. Packed in 25 lb. boxes.



The Steel (our own make) is best suited for Calks; welds with sand and wears well. Perfectly graded in Length and Size.

**TOE CALKS**

Chisel Pointed Prong. These cuts show exact size of No. 2. SAMPLES SENT FREE.

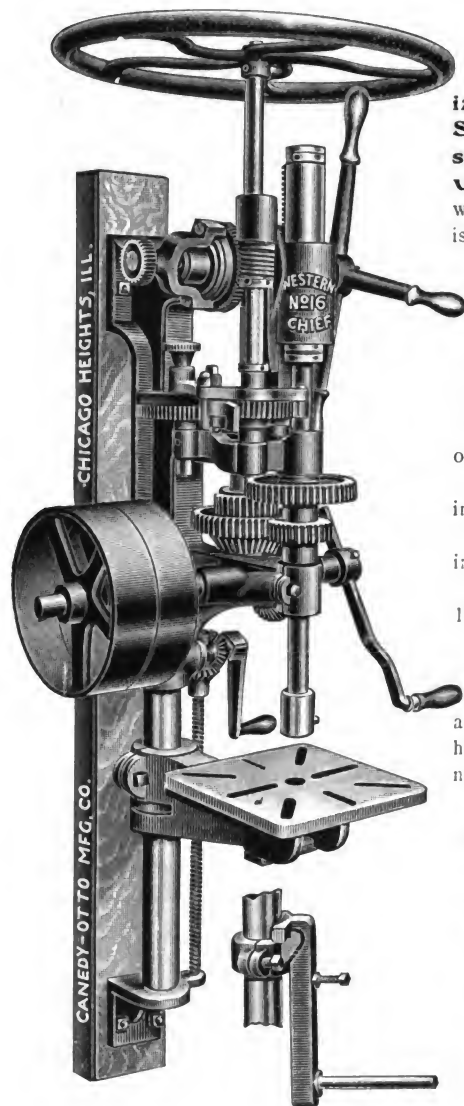


The Prong does not enter and weaken the Shoe at the crease. The only slightly curved Calk sold.

MANUFACTURED BY

**RHODE ISLAND PERKINS HORSE SHOE COMPANY**  
PROVIDENCE, RHODE ISLAND.

# No. 16 = Western Chief Drills = No. 17



## DESCRIPTION

**Hand Lever Feed, also Horizontal, Gear Driven Positive Self Feed, changeable instantly to fast, slow or medium speed as desired.** These feeds work independent of each other and bit is lifted quickly.

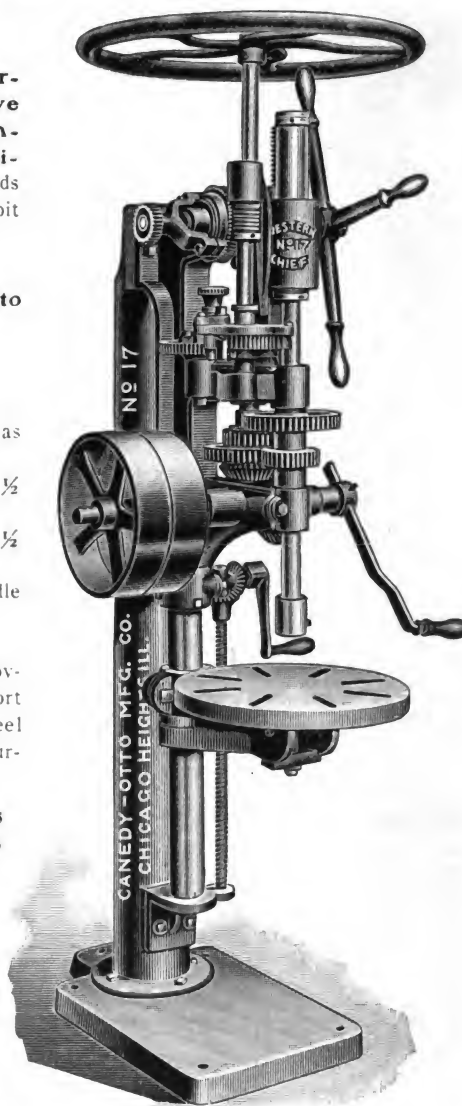
### Cut Gears.

**Raise and lower device to table**

Drills to center of 24-inch circle.  
Bores from 0 to 1½ inch.  
Takes Bits ½ or 41-64 Shank as ordered.  
Spindle has up and down run of 8½ inches.  
Table has up and down run of 15½ inches.  
Greatest distance from table to spindle 18½ inches.

Wheel rims can be drilled by removing table and using the forked support as a wheel holder. A special wheel holder attachment as illustrated is furnished when desired.

**No. 16, Weight 360 pounds  
No. 17, Weight 560 pounds**



## Royal Blower

**"The Successful Blower"**

Gear case is oil-tight and dust-proof. Gears run in a continuous bath of oil. No spiral gears, worm gears or ball-bearings. Crank turns forward or backward. Fan 12 inches. Weight 135 pounds.

Fire pot is 8x9 1-2x4 inches inside.  
Needs no Clay.



Some  
**"Popular Tools"**

Made by

**CANEDY - OTTO  
MFG. COMPANY,**

**Chicago Heights, Ill.**

FOR SALE BY  
**First-Class Dealers**  
EVERYWHERE.

## SAVE The Dealer's Profits

### BUY WHEELS DIRECT FROM THE FACTORY

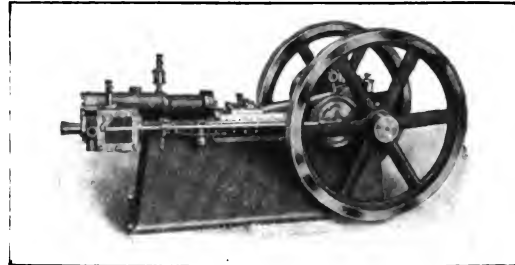
We can save you money on all sizes of wheels; in the white, painted any color and with steel or rubber tires. We bore wheels for boxes without extra charge. Give us a trial order and we will make you one of our many satisfied customers. Write for special prices to *American Blacksmith* readers.

**Carriage Wheel Supply Co.**  
UNION CITY, IND.

## BLACKSMITHS AND WHEELWRIGHTS

Who are going to buy an engine should buy the **BEST**, because you have no time to waste. Buy an engine that is designed for work, with all the latest improvements. The name is the

### ROBERTSON STRAIGHT LINE GAS OR GASOLINE ENGINE.



Interesting circular sent free.

Made from 4 to 40 H.P.

These engines are run on any grade gasoline or natural or artificial gas at a few cents per day. No coal or dirt.

Note you have no batteries, coils, magnetos, hot tubes, etc., to give you trouble. They are simply perfection and our agents offer is open in some territory. Write at once, today.

**Robertson Mfg. Co., Buffalo, N. Y.**

## MAYERS COLD TIRE SETTER.

EVERY OUNCE, PIECE and PART  
WARRANTED STEEL.

Weight 700 Pounds.



There is always just the REQUIRED DISTANCE between the heads for the SIZE wheel you are setting. A large wheel, more space. Small wheel, less space. The tire is made to HUG the felloe, but it's SIMPLY IMPOSSIBLE to INJURE it. Other machines have tendency to KINK tire away from the felloe, our way makes it HUG but not KINK. After a little experience you can set a tire PERFECTLY and not use the felloe clamp or cross piece at all.

**SIMPLICITY**  
with Power  
**DURABILITY**  
with Speed



The only cold tire setter made in which **BOTH HEADS** come together at **Same Time**. Each side of the wheel gets the same pressure. A  $3\frac{1}{2}$  inch (in diameter) **Machine Steel Screw** with right and left handed nuts, with powerful beveled gears does it. Both heads coming together at the same time, the grip keys take hold and **set themselves** against the side of the tire. No "successful way or device" is needed. **They do it Themselves** and we are **protected by patent**. After tire is set and heads come apart at the same time, no "successful way or device" is needed to get them loose.

**They do it themselves.** "A truth half told always hurts—the other way." The heads do move on a straight line. It's the **Best Idea** of the whole machine. By opening out the heads the circle is **Increased** and will fit a wheel 60 inches in diameter. By closing heads a little it fits, say a 48 in. wheel. Close it more and it fits a 30 in. wheel. You can fit **any** size wheel. The heads are never closed **entirely**.

Will you read this letter? It was unsolicited or unasked for and was voluntarily sent us **after** machine had been thoroughly tested and **paid for in full**.  
Montgomery City, Mo., May 10th, 1906.  
"To Whom it May Concern:—The Henry Mayers tire shrinker is the grandest machine I ever saw. I can take four wheels off the spindles, set the tire and put them on the spindles again in less than thirty minutes. I cannot find words to express my delight with this machine."  
Yours truly,  
W. O. SAILOR.

**CONCLUSION:** If you **Really** want a machine and mean business, We have a **Proposition** which will interest you.

**HENRY MAYERS MACHINERY CO.**  
1721-23 North Eighth Street,  
ST. LOUIS, MO.



## **MORGAN & WRIGHT TIRES AND PADS HAVE WON THE CONFI- DENCE AND INCREASED THE BANK ACCOUNTS OF SHOERS.**

The reason why

**MORGAN & WRIGHT PADS**  
have made such a decided hit with wide-  
awake shoers is due almost wholly to  
this fact:

*They have educated hundreds  
of horse-owners to the pad-using  
idea by proving to them that  
GOOD pads are a big help in  
keeping a horse in WORKING  
condition. More than this, these  
pads give the horse-owner  
LONGER SERVICE FOR HIS  
MONEY than do other brands,  
thus helping the shoer to build  
up a BIG business.*

Ask any shoer who has tried them as  
to whether they help the pad business.

They are made of exceptionally  
tough stock; are scientifically correct in  
shape; run longer than do other brands;  
are decidedly easy to fit; and **cost no  
more than other kinds.**

Try them. They'll help you get the  
pad business of your town.

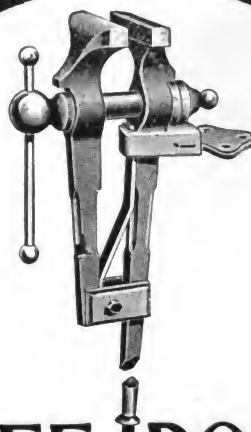
Any jobber can supply you.

**MORGAN & WRIGHT PADS  
ARE GOOD PADS**

**You can find shoers everywhere who are  
handling Morgan & Wright goods EX-  
CLUSIVELY, simply because they have  
PROVEN that it always PAYS to do so.**

**MORGAN & WRIGHT,  
CHICAGO.**

New York Dayton Detroit Atlanta St. Louis  
San Francisco



## **THREE POINTS**

TO BE CONSIDERED IN

## **Solid Box Vises**

Before buying *Solid Box Vises*,  
look them all up and pay for  
them according to the *amount of  
work* they will do for *YOU*. Con-  
sider these three points:

- 1.—*The WIDER THE JAW, the  
LARGER THE WORK it will  
hold securely.*
- 2.—*The WIDER the vise OPENS,  
the LARGER the work it will  
take.*
- 3.—*The HEAVIER the VISE, the  
HEAVIER the work it will  
stand up under.*

The "Columbian" Solid Box  
Vise is standard in these  
three respects.

Besides this they are made from high grade  
material, specially selected to stand rough  
and constant usage. The jaws are highly  
polished, giving a perfectly even and finish-  
ed appearance.

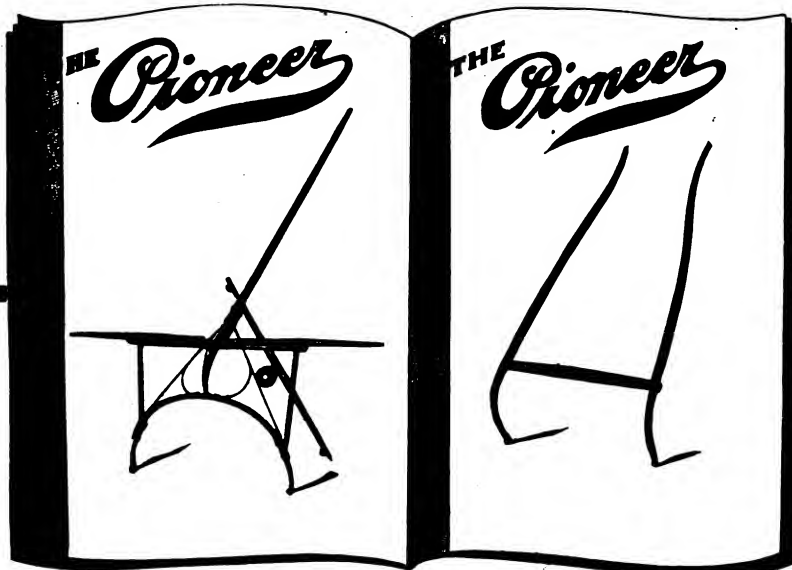
Our Vise and Anvil Catalogue No. 16  
gives the dimensions a Solid Box should be  
when finished, the distance the vise opens,  
the width of jaws, the weight, etc., on all  
sizes from 25 to 200 pounds.

Send for it and keep it on file. It will  
help you "get your money's worth," and to  
select a practical and serviceable vise.

A penny postal will bring it.

**THE COLUMBIAN HARDWARE CO.**  
MANUFACTURERS  
CLEVELAND, OHIO, U. S. A.



**IRONING FACTORIES**

Anderson, Ind.  
Troy, O.  
Sidney, O.  
Cincinnati, O.  
Canton, O.  
St. Louis, Mo.

**BENDING FACTORIES:**

Piqua, O.  
Troy, O.  
Akron, O.  
Wellington, O.  
Ashtabula, O.  
Muncie, Ind.  
Anderson, Ind.  
Memphis, Tenn.

**SEND FOR THIS BOOK**

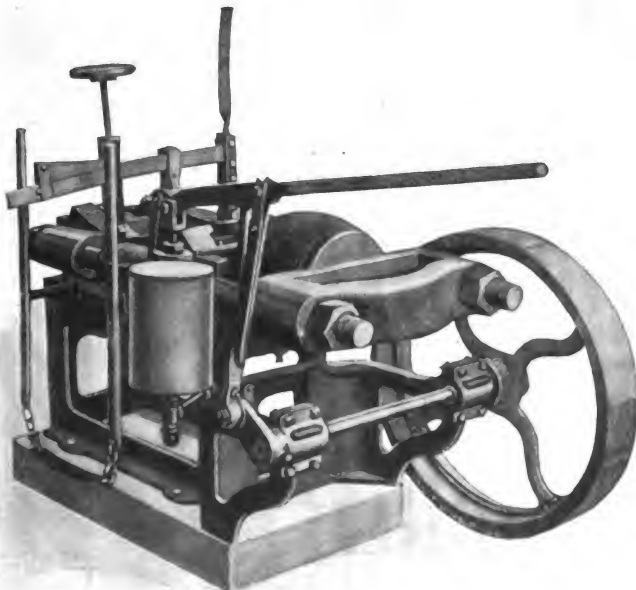
**W**E would like to have your permission to send you a copy of our Catalogue, showing the different styles and sizes of poles and shafts manufactured by us.

The PIONEER BRAND has been brought to a standard of excellence in quality and style by the result of years of labor and study of the trade's wants, and is recognized as the peer, as is attested to by the most critical manufacturer, and is demanded by all buyers of vehicles throughout the country. Address all communications to

**The PIONEER POLE & SHAFT CO., Piqua, Ohio.**

## The **SCIENTIFIC** Cold Tire Setter

Sets Tires Cold by a few Strokes of a  
**POWERFUL HYDRAULIC PUMP**  
It can be Worked by Hand or Power



It has steel head blocks that cannot be broken.

It has tool steel gripping blocks that can easily be retempered.

It has an automatic device for adjusting the gripping blocks to the circle of any height of wheel.

It has a quick gripping arrangement to grip the tires instantly without the use of a hammer.

It releases its grip instantly when tire is set.

It is **WARRANTED** to SET TIRES EASIER AND QUICKER than any other edge grip machine made.

You'll be sorry if you don't buy one.

It is sent on trial. Send for descriptive Catalogue.

**Standard Tire Setter Co.**  
**KEOKUK, IOWA.**

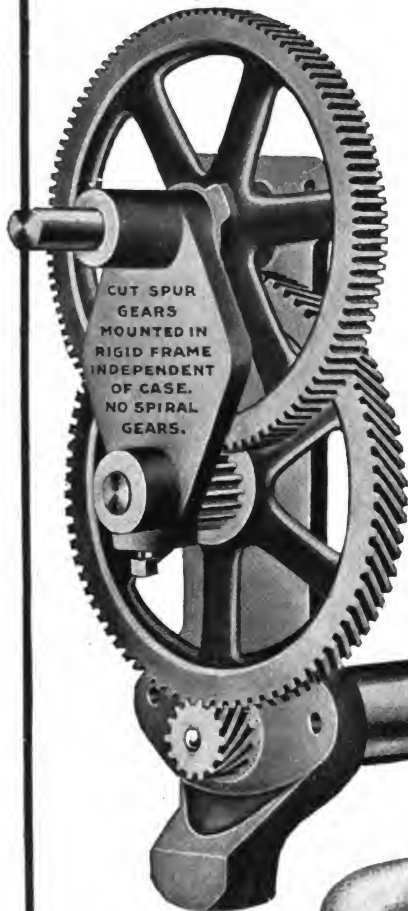
This Cut Shows the SCIENTIFIC with Power Attachment

# Buffalo 200 Blower

**"PRIDE OF TODAY'S SMITHY."**

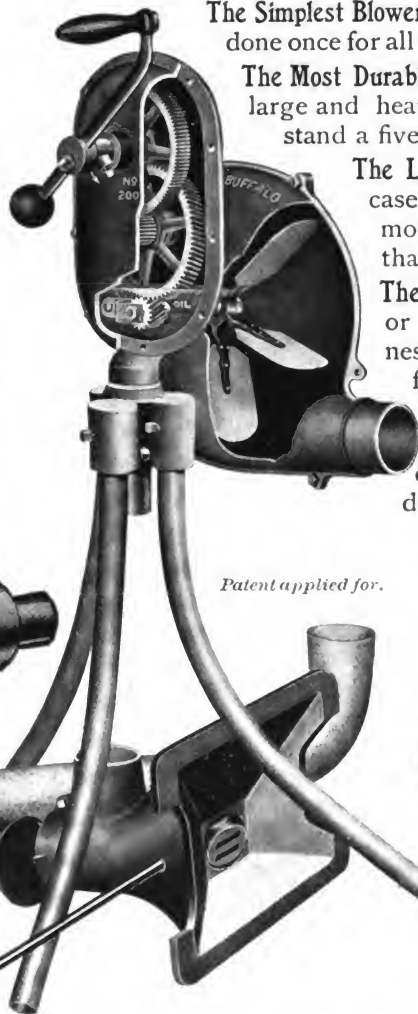
**Five Year's Protection against Repairs.**

**BUILT ON MODERN MECHANICAL PRINCIPLES.**



Gearing Used on Buffalo Nos. 200 and 201 Blowers.

Canadian friends:  
Save duty, buy of  
The Canadian  
Buffalo Forge  
Company,  
Montreal, Quebec.



Patent applied for.

Buffalo No. 200 Blower and H. H. Tuyere as now furnished with every machine. Crank turns in the direction of arrow.

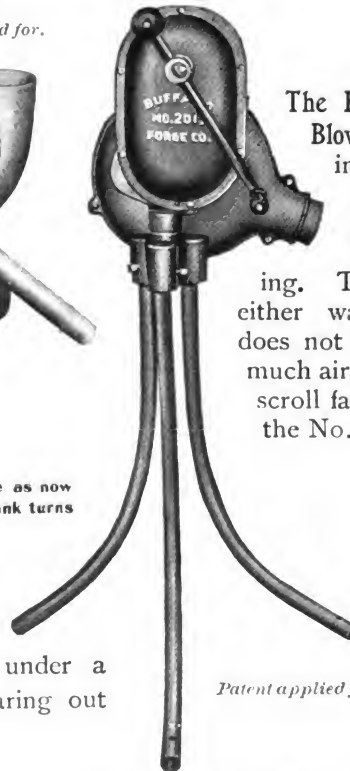
**The Simplest Blower**—no adjustment needed. That is done once for all by expert mechanics in our own factory.

**The Most Durable Blower**—look at the gears, strong, large and heavy. No watch-case mechanism can stand a five year guarantee.

**The Lightest Running Blower**—our scroll fan case is the correct scientific one and gives more air per revolution with less power than any other form.

**The Sturdiest Blower**—no racking, twisting or battering strain can put it out of business. Gears are held in a cast-iron box frame with extra length bearings.

**The Busy Man's Blower**—oil it once a month and it is always in perfect condition. Gears run in oil in an air tight dust proof case.



Patent applied for.

The Buffalo No. 201 Blower is identical in every respect with the No. 200 except the form of fan casing. The crank turns either way but blower does not deliver quite as much air as the standard scroll fan casing used on the No. 200 Blower.

The Buffalo Nos. 200 and 201 Blowers are guaranteed to be more durable and easy running than any other blower on the market. They are sold under a positive guarantee for five years. Any part wearing out within that time will be replaced free of cost.

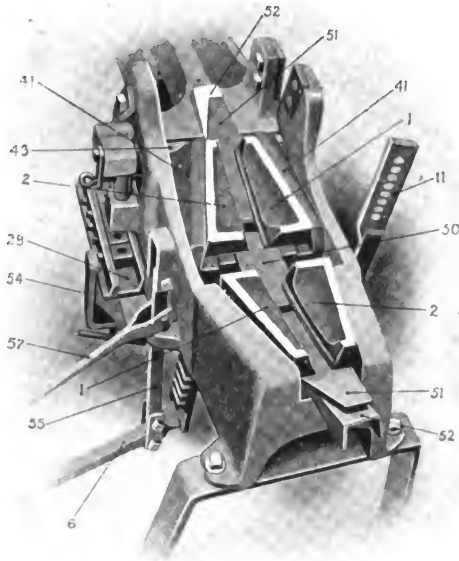
**PLACED IN YOUR SHOP  
FOR FREE TRIAL**

*Copy of our latest illustrated Catalogue cheerfully sent on request.*

**BUFFALO FORGE COMPANY**  
BUFFALO, N. Y.

Buffalo No. 201 Blower furnished with H. H. Tuyere.





This is a cut of our new improved No. 2 machine which sets all size tires up to 2 by  $\frac{3}{4}$  inches and shears  $\frac{3}{8}$  by three flat iron, and  $\frac{3}{8}$  round. Punches holes up to  $\frac{1}{2}$  inch, and does it almost as fast as you can count. Can be changed from one size hole to the other in two seconds.

## THE IMPROVED HOUSE COLD TIRE SETTER

Our No. 2 improved machine has both hand and power attachments and easily sets all ordinary tires up to 1 by  $4\frac{1}{2}$  inches, and shears 1 by 5 flat iron,  $1\frac{1}{4}$  round, and cuts off axles up to  $1\frac{1}{2}$  square and will punch all size holes up to  $\frac{5}{8}$  in.

By using the tire setter frame for shear and punch we produce same with little additional cost, and we therefore make each customer a present of a shear and punch worth at least \$80.00.

We have thousands of our machines in use and none of them are broken up, or worn out or abandoned. They cost nothing to keep in repair, and they do the work right. The heads move with the circle of the wheel, pulling the tire from both ways evenly, not injuring the felloes as the so-called Tire Setters do, where the heads move back and forth on a straight line; for instance, when their heads are apart to receive the wheel, the tallest one will fit down in them, but when closed as in shrinking, the curve in the heads just fits an ordinary wheel. You know the consequence if you close in the circle of a portion of a tall wheel to the circle of a small one.

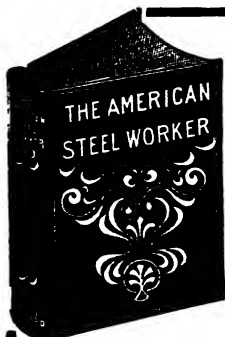
Don't let them deceive you.

We have the only successful grip-keys and the only successful way for adjusting the same, both of which are patented. Others who claim to have our grip-keys are only using what we have thrown away.

**Write us for catalogue and prices of our old style as well as our improved machines**

## HOUSE COLD TIRE SETTER CO.

Office and Factory 216-220 South Third Street, ST. LOUIS, MO.



## "BEST BOOK I EVER SAW"

Writes a blacksmith. Lots of others say so, too. Markham has been hardening steel for 27 years and studying it all the time. He tells in plain English just how to handle each case. Shows the best methods; but if you can't get them, it tells you how to do good work with what you have.

You can build a first-class furnace if you want to from his plans and use any fuel you like.

Don't think you've got this information in other books—you haven't. It isn't there. Other books may read nicely and sound well, but none of the authors has had Markham's experience, and that's what counts.

343 pages, \$2.50.

Money back if not satisfied, or sent on approval.

AMERICAN BLACKSMITH COMPANY,  
P. O. Drawer 974. BUFFALO, N. Y.

## THE *Little Giant*

COMBINED

### *Punch and Shear.*

*The Most Powerful Lever  
Punch and Shear Made.*

**5 Punches and Dies with  
Each Machine.**

**MADE IN THREE SIZES.**

No. 1—Will punch  $\frac{5}{8}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{3}{8}$ -inch thick and 1-inch round. Weight, 515 lbs.

No. 2—Will punch  $\frac{1}{2}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{1}{2}$ -inch thick and  $\frac{3}{8}$ -inch round. Weight, 350 lbs.

No. 3—Will punch  $\frac{3}{8}$ -inch hole in  $\frac{3}{8}$ -inch iron. Cuts iron  $\frac{3}{8}$ -inch thick and  $\frac{3}{8}$ -inch round. Weight, 280 lbs.

Only ONE operation of the Lever does the work. No changing required.

Note the improved Stripper and Hold-down. This machine is made for the blacksmith shop, and we DO claim that it is decidedly the best on the market for that place.

**For Sale by your Jobber. If not, Write Us. Send for Circular.**

**Little Giant Punch & Shear Co., Sparta, Ill.**



CORRUGATED PATTERN.

**On the Race Track and on the Road, In All Classes of Work,  
Capewell Horse Nails Give UNIVERSAL Satisfaction.**

**"I think them the only nail in the world for Race Horses."**

ALLENTOWN, PA., Sept. 21, 1905.

THE CAPEWELL HORSE NAIL CO.,

Gentlemen:

I shod Dan Patch this morning, for his record breaking performance, with No. 4½ Plate nails, Capewell.

He reduced the world's record on a half-mile track from 2.08 to 2.01; also from 2.11 to 2.05 for wagon.

I have driven Capewell nails for years on the Grand Circuit. I think them the only nail in the world for race horses.

With best wishes,

Yours truly,

J. F. HANSON.

**A Nail that will Stand the Test of the Race Course  
will Stand Anywhere.**

Made by **The Capewell Horse Nail Company**  
**HARTFORD, CONN.**

The Largest Manufacturers of Horse Shoe Nails in the World.

**BRANCHES**

New York: . . . 103 Beekman St.  
Philadelphia: . . . 323 Arch St.  
Baltimore: . . . 6 East German St.  
Buffalo: . . . . . 11 Ellicott St.  
Cincinnati: . . . . . 720 Main St.  
Detroit: . . . . . 29-31 Farrar St.  
Mexico City: . . . Apartado, 2377

Chicago: . . . 238-240 Randolph St.  
St. Louis: . . . 12-14 North 12th St.  
New Orleans: . . . 736 Union St.  
Denver: . . . . . 1611 Blake St.  
San Francisco: . . . 636 Mission St.  
Portland: . . . 554 Worcester Block.  
Toronto, Canada: . . 50-56 Duke St.

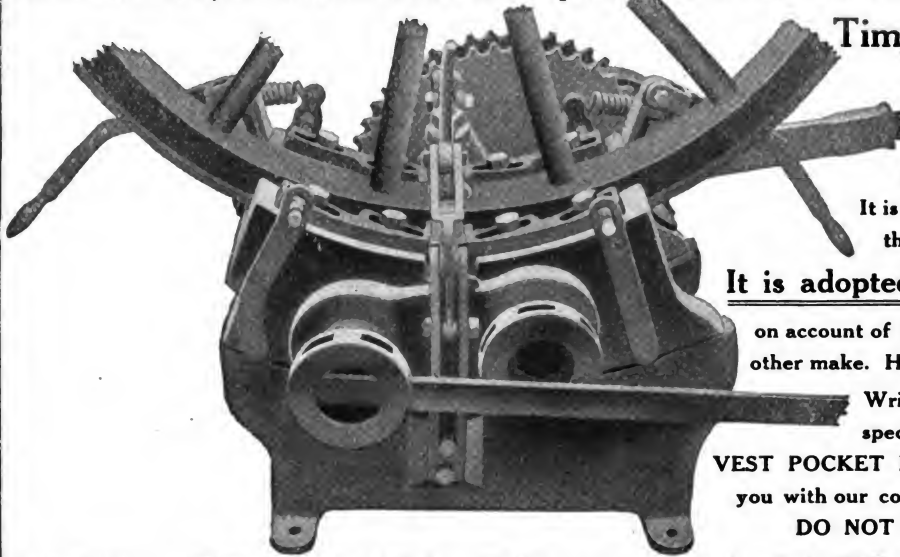
Catalogue Free upon Application.

PLATE PATTERN.



# YOU ARE THE MAN

Who would be setting the hundreds of tires that others are setting in your locality every year, if you had a **BROOKS**. It gets the business. It sets all sizes of tires by compressing the metal cold. It does the work in from two to five minutes. It is the only machine that has an automatic device for gripping the tires so that the keys will not slip. The **BROOKS** is the easiest operated, the strongest in construction, the most durable and compact Cold Tire Setter built.



## Time and Experience Must Precede Perfection

The **BROOKS** is built by the oldest manufacturers of edge grip machines. It is the superior of all others and receives the highest awards wherever shown.

## It is adopted by the Government Shops

on account of its demonstrated superiority over every other make. Has no equal for rapid and accurate work.

Write us for **DESCRIPTIVE BOOKLET**, special terms and free trial, and a handy **VEST POCKET MEMORANDUM BOOK** will be sent you with our compliments.

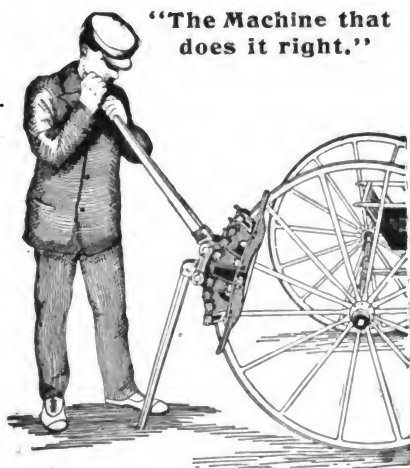
**DO NOT DELAY—WRITE TODAY.**

# THE BROOKS TIRE MACHINE COMPANY

121 North Water Street,

WICHITA, KANSAS.

# SCHAU TIRE SETTER



"The Machine that does it right."

3,000  
in use  
in the  
United  
States  
and  
Canada

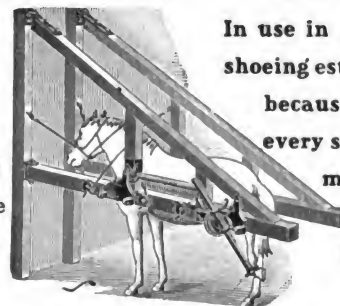
Write for Catalogue.

## BURTT MFG. CO.

Kalamazoo, Mich.

# BARCUS HORSE STOCKS

Every one fully guaranteed. All of the objectionable features of the cheap stocks eliminated.



In use in all modern shoeing establishments because they fill every shop requirement and give satisfaction everywhere.

## BARCUS STOCKS

are simple, strong, solid, safe and sure to hold. No ropes or pulleys to tangle or break, no bracing to roof or floor, but furnished complete ready to bolt to the stationary posts in your shop. You can rely on the **BARCUS STOCKS** every time.

ASHLAND, ILL., May 14, 1905.  
MR. GEORGE BARCUS:—I wish to say that the horse rack we bought of you gives perfect satisfaction in all respects.

Yours respt.,  
HODGINS & DOUGLASS.

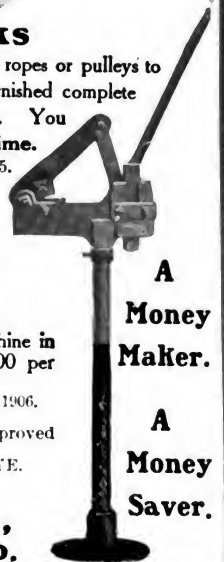
## The Barcus Improved Toe Calk Machine

Has a record of five toes per minute, and this machine in your shop will save you in cash at the rate of \$6.00 per day when in use.

WARSAW, IND., March 26, 1906.  
GEO. BARCUS & Co., Wabash, Ind.  
SIR:—I am well pleased with the Barcus Improved Toe Calk Machine.

Yours very truly,  
FRANK NYE.  
Write for particulars.

**Geo. Barcus & Co.,**  
Box 61. WABASH, IND.



A  
Money  
Maker.

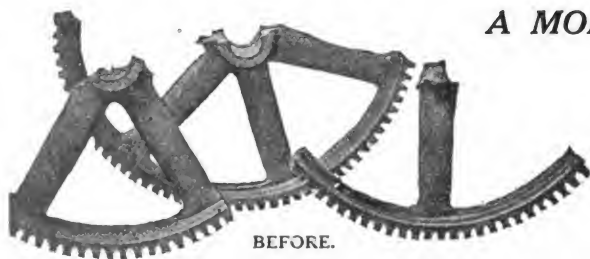
A  
Money  
Saver.

The Class of Work that

# WELDARINE

WILL DO.

TRADE **WELDARINE** MARK.  
REGISTERED.



BEFORE.

A MONEY MAKING  
PROPOSITION

FOR

BLACKSMITHS  
MACHINISTS



AFTER.

AND REPAIRERS OF MACHINERY

THIS ADVERTISEMENT IS WORTH 50c TO YOU IF SENT TO YOUR JOBBER  
OR TO US ON OR BEFORE JULY 10th.

NOTE CONDITIONS NAMED BELOW

Messrs. Blacksmith &amp; Repair Mechanic:—

We would like to have a heart-to-heart talk with you in regard to **WELDARINE**.

As stated in our previous advertisements, with **WELDARINE** you can braze any casting you can get hot and make it as good as ever without patches of any kind.

With **WELDARINE** you can braze cast-iron, any kind of iron or steel, cast-iron to steel or cast-iron to copper.

We have received hundreds of letters from parties who have ordered one of our sample sets or a full working set and each and every man makes the following statement: "There is a great deal of this kind of work to do here and **WELDARINE** is just what we have been looking for."

Within the next thirty days we desire to place one full working set of **WELDARINE** with every repair mechanic and every blacksmith who reads this most excellent Journal. We want them to start the summer season of 1906 RIGHT and that this end may be attained, we shall on receipt of this advertisement duly dated and signed together with \$3.50 forward, charges prepaid, one full working set of **WELDARINE** that sells everywhere for \$4.00 per set.

If your jobber is handling **WELDARINE**, send your order to him together with coupon, as same will be accepted by us at a valuation of 50c if sent in on or before July 10th, 1906.

THE ABOVE PROPOSITION ACCEPTED

Date.....1906

Signed.....Address.....

### WHAT THEY SAY

Chouteau, Mont.  
I enclose check \$4.00 for which please send a set of "Weldarine." I gave the \$1.00 set a test and believe it is O. K.  
CHAS. H. CONNOR.

Osage City, Kans.  
I have used one set of "Weldarine" and am now on the second. Have mended some very heavy pieces. There is no trouble to weld any piece of broken cast-iron if directions are carefully followed.  
J. L. WILLIAMS.

Seattle, Wash.  
Replying to your favor of the 7th inst., we are pleased to say that we have used "Weldarine" with very satisfactory results.  
Seattle Machine Works,  
E. JOHNSON, Supt.

One set of **WELDARINE** will do from \$50 to \$75 worth of work. Price \$4.00 per set. Put up four packages and quick kleaner in a neat wood box.

Positively guaranteed to give perfect satisfaction. Sold by all up-to-date Heavy Hardware Jobbers and Machinists' Supply Houses.

### SAMPLE SET, ONE DOLLAR.

If your Jobber is not at this time handling **WELDARINE**, send us \$1.00 for a sample set of **WELDARINE** that will do from \$10 to \$15 worth of work, or \$4.00 for full working set. Sent charges prepaid, to any address.

Satisfaction guaranteed or money refunded.

Kindly give us name of your Jobber, and we will arrange for him to supply your future needs.

## THE WELDARINE MANUFACTURING COMPANY,

(Incorporated)

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Cable Address, "WELDARINE," Western Union Code.

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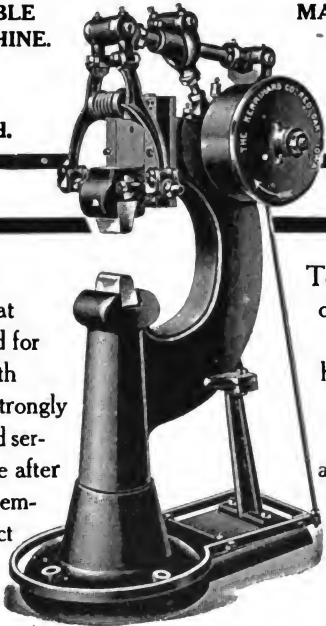
Adapted to all shop uses. Does the  
WIDEST RANGE OF WORK.

A RELIABLE  
MACHINE.

MADE BY A  
RELIABLE  
FIRM.

Every one  
Guaranteed.

Satisfaction  
Everywhere.



This is the Hammer that was designed for the blacksmith shop and is strongly built for hard service. Made after correct lines, embodies correct mechanical principles.

To give the shop owner a durable and efficient hammer, we use only the very best material and employ only the most skilled workmen. It pays to buy the best.

Height over all	-	-	55 in.
To top of Anvil Block	-	-	31 in.
Floor Space	-	-	18 x 30 in.
Weight	-	-	700 lbs.

### YOUR EQUIPMENT IS NOT COMPLETE

If your shop does not contain a Kerrihard hammer. This is the most valuable addition you could make to your outfit. The Kerrihard hammer is built right, runs right and will do your work right.

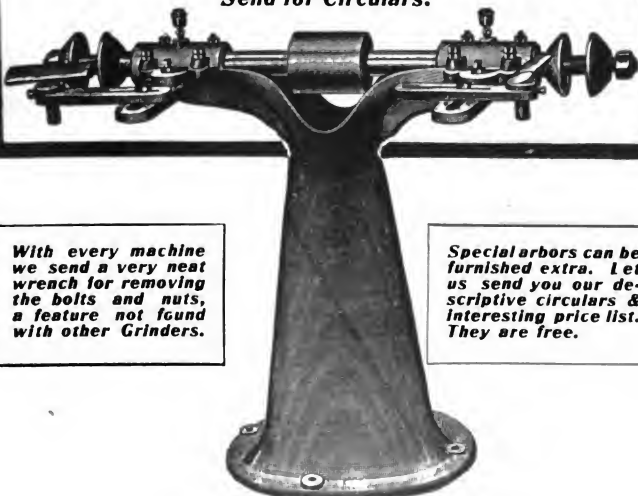
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Ball Bearing

## Shaft Coupling Automatically Takes Up the Wear

**T**HE point is, you want a noiseless, quick-shifting Coupling that will stand the test of time. The BRADLEY does this. In the BRADLEY the shaft eye is surrounded by a packing of hard oak leather, compressed and moulded into shape and thoroughly saturated with tallow. This packing is the only part of the BRADLEY that wears.

**B**UT in the BRADLEY SHAFT COUPLING there is also a SPRING, of crucible steel, oil tem-



"The spring does it."

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**T**HE spring's the thing that does the business. Its pressure is constant and uniform—just sufficient to hold the coupling, with its leather packing, securely in place, and TAKE UP THE WEAR. The BRADLEY is the ONE and ONLY SHAFT COUPLING that takes up its own wear.

**C. C. BRADLEY & SON**  
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Don't forget that we Make Bradley Ball Bearing Couplings.



No. 8 REGULAR HEAD.—Exact size.

**"NEW STANDARD" HORSE NAILS**

The letter "S" appears on the head of each nail.



No. 8 CITY HEAD.

Exact size.

**Best Nail in the World BAR NONE.****DEALERS' NET PRICES TO SHOERS.**

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Lb.....	.19	.16	.15	.14	.13	.13	.12	.12

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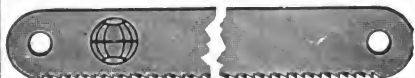
Uniform Horse Nails. In length, breadth, thickness, blades, points, quality and PRICE, and the best driving and holding nail ever produced.

We mean every statement made above.

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BLOWER  
THAT  
BLOWS  
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GOOD



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MAKES THE SMITH'S  
WORK  
LIGHTER

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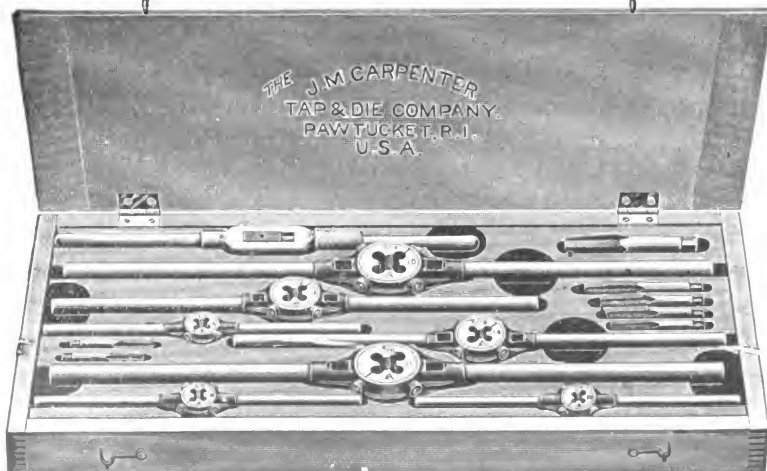
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**GENUINE  
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Patented Sept. 12th 1899.

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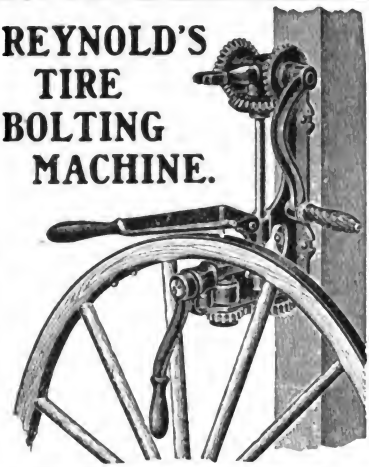
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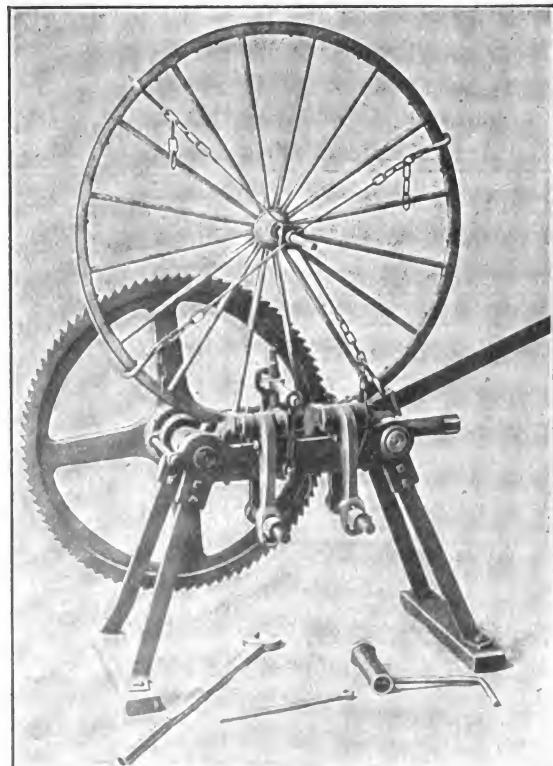
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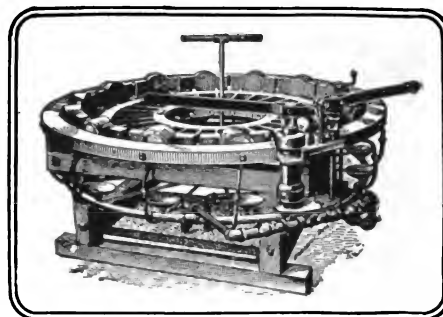
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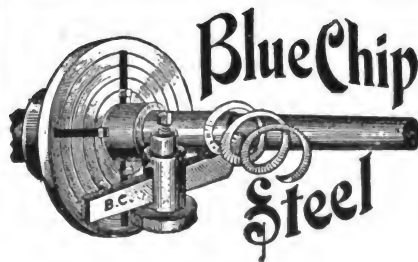
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The ONLY hammer on  
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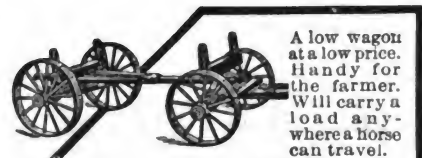
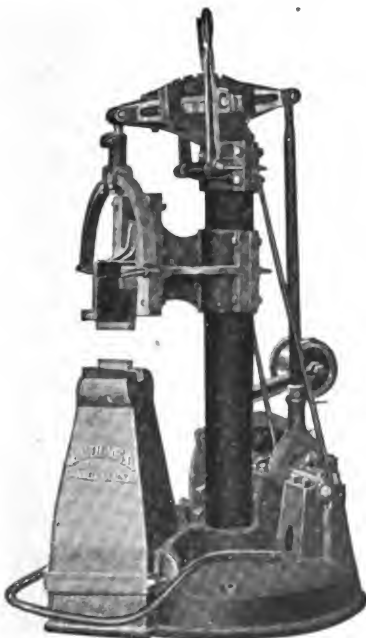
The shifting lever controls  
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DOWN DRAFT FORGE  
No. 666.

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# Portable Down Draft Forge

A MOST INGENUOUS APPLICATION OF THE BUFFALO DOWN  
DRAFT SYSTEM.

ALL SMOKE, GASES, FUMES AND CINDERS  
ABSOLUTELY DONE AWAY WITH.

The hottest flames and stifling heat can no longer cause the smith such discomfort as he has hitherto been compelled to submit to.

## HOW THEY WORK

On turning the crank of the powerful No. 200 Blower attached to this forge, all smoke and gases from the fire are drawn into the stack by means of the draft produced by a connection to fan case. The larger part escapes up the stack by reason of the natural and induced draft while a portion passes through the fan into tuyere. A separate connection from blast pipe into stack strengthens the natural draft and is of great service when fire is being started.

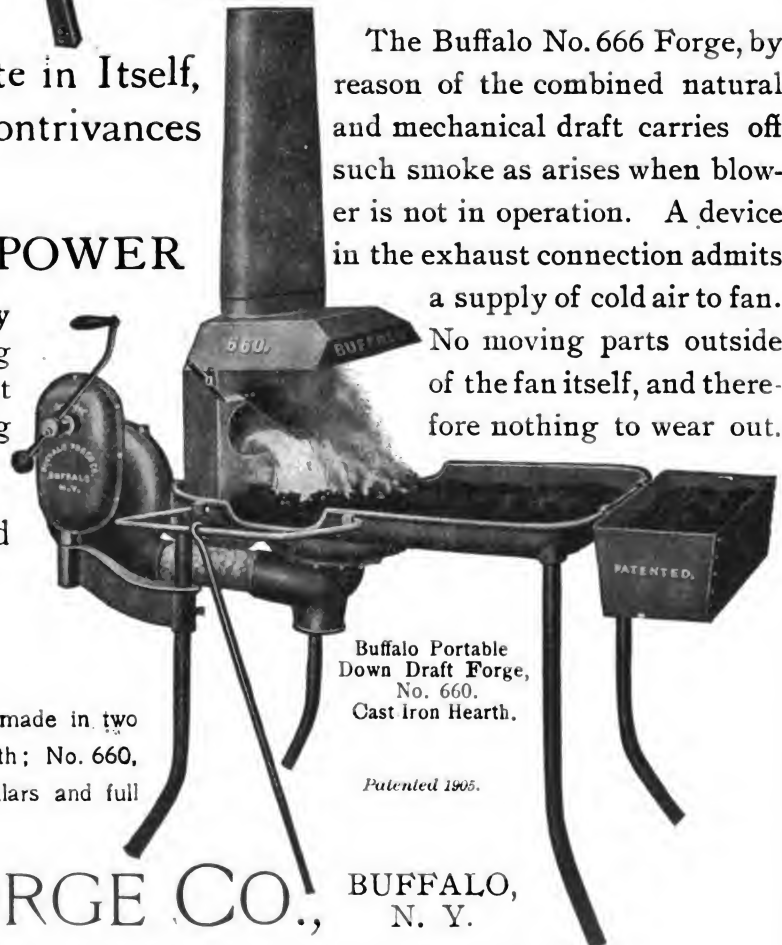
Every Forge is Complete in Itself,  
and Needs no Exterior Contrivances  
Whatever.

## NO ADDITIONAL POWER

No additional power is necessary to operate blower. In place of taking air at the fan case, blower takes it from over the fire, producing a strong draft without extra effort.

Put in a Buffalo No. 666 and  
keep the Smithy Clean,  
Cool and Light.

Buffalo Portable Down Draft Forges are made in two styles: No. 666 made with Steel Plate Hearth; No. 660, made with Cast Iron Hearth. Send for circulars and full particulars.



Buffalo Portable  
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Cast Iron Hearth.

Patented 1905.

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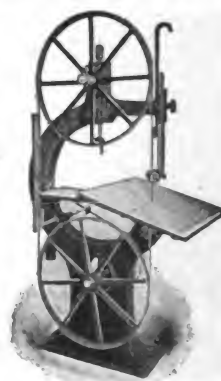


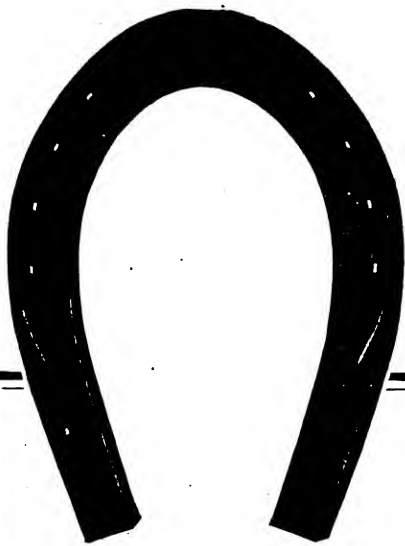
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*Patent Applied For.*



*Patent  
Applied  
For.*

### Buffalo Punch, Shear and Bar Cutter No. 4 $\frac{1}{2}$

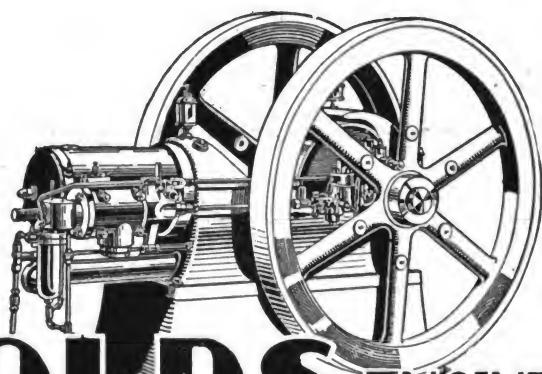
Punches  $\frac{1}{2}$ -inch holes in  $\frac{3}{8}$ -inch plate. Shears plate of any width and up to No. 8 gauge. Bar cutter cuts off round bar from  $\frac{3}{4}$ -inch to 0, and flat bar 2 $\frac{1}{2}$ x $\frac{3}{8}$ -inch. Height over all, 55 inches. Weight, 460 lbs.

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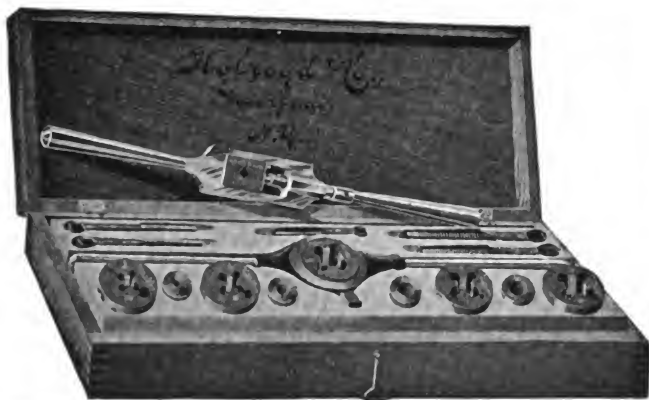
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# THE AMERICAN BLACKSMITH

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## The Tax on Denaturized Alcohol.

The present session of Congress has just passed the bill for removing the tax from denaturized alcohol and while prospects for the bill's passage were by no means bright at the beginning of the present session, its supporters were successful after a strenuous fight. Experts have told of the great possibilities of cheap alcohol in the arts and trades and what it will mean for the agricultural interests of the country. Stories have been told of the great savings to European industries on account of free alcohol, and these accounts if but partly true are sufficient reason for freeing this product from taxation.

The demand for benzine and gasoline which is growing stronger each day with no material increase in the supply, will tend to increase the price of these products. Now that alcohol is declared free from tax it will give to users of internal combustion engines a new cheap fuel for use in an engine differing but slightly from the now popular gasoline engine. Taking the tax off alcohol will also enable farmers to get some return for the large quantities of farm products which are now mostly waste

matter. We are told that the corn stalks of the country alone would yield an annual income of several millions of dollars. When we consider that wood, sawdust, straw or any substance containing sugar or starch may be made to furnish its percentage of alcohol by a very simple process, we get some idea of the value of untaxed denaturized alcohol. And all this means more money for the farmer and in turn for the smith. For little that directly affects the prosperity of the farmer does not have a like effect on the welfare of the blacksmith.

## When Ordering Your Supplies.

Unless a smith be initiated into the inside workings of a great wholesale manufacturing establishment, he has very little idea of the amount of time and trouble expended on the great number of unintelligible orders which are received. In fact, a large part of the work done by the wholesaler's office force consists in deciphering and correcting errors and omissions in the orders written more or less carelessly by customers. All of this takes time, of course and in most cases means a delay in the delivery of the goods and this for the smith often means the loss of an order or two, and finally dissatisfaction between the supply house and the smith.

If the smith will exercise a little care when sending his order to manufacturer or jobber, all this trouble, annoyance and loss of time would be avoided. Those concerns who supply regulation order blanks for their customers' use, simplify matters greatly for both themselves and the smith, but in the absence of order blanks, the ordering smith will do well to bear the following simple rules in mind: Write legibly on one side of the paper only, stating clearly just what you want. Should your order consist of more than one class of goods, group the various kinds of goods as much as possible, or better still, write the order for each class on a separate sheet. Stick strictly to business; if necessary to write on other matters, put them on a separate sheet. Write on ruled paper, and on

every line, and don't write up the margin of the sheet. When making up an order from a catalogue, give the number of the page on which the article may be found, besides a concise description of the goods wanted. State how you want your goods shipped; the station and the route are important. And lastly, keep a copy of your order. It will save you lots of trouble and may prevent you ordering any goods twice. A copy of your order will facilitate matters should the original order be lost in transit, and it will enable you to make sure you receive exactly what you order. Devices for copying are numerous and inexpensive or the use of carbon paper will answer the purpose in good shape. In any case it is well worth the cost. The smith who remembers these simple little matters will save himself much time and trouble and a deal of unnecessary worry.

## The Ounce of Prevention

The apprentice question has received no little amount of attention from our readers in the past few months and while few remedies have been suggested, the discussions have, we think, had a good effect on the general craft. As in all problems, great or small, an ounce of prevention is worth a pound of cure and in the May paper Mr. R. E. Stephenson tells of his method of preventing apprentice troubles. The best part of Mr. Stephenson's method is that his intention is to make as good smiths out of his boys as possible, and in doing this he is naturally free from apprentice troubles. There is no questioning the success of this smith's plan and both from his own standpoint and that of his "boys" it is highly commendable. Mr. Stephenson says: "They are two as fine boys as can be found." Of course they are; they receive proper treatment and this, coupled with good material with which to start, will make craftsmen that will be kings in their trade. The smith employing apprentices owes them just as good a training as he can possibly give them and he should remember that



A WROUGHT IRON LAMP MAY BE VERY ARTISTIC AND BEAUTIFUL AND YET NOT GAUDY.

as the boy is led so will the man follow "But if I see this business doesn't suit them I will try to find another place for them." If more of this spirit were displayed in the craft we would have few if any incompetent smiths, and this means fewer price-cutters. If the boy doesn't take naturally to smithing, see that he gets into the right trade or profession. It's not the man who loves his work and does his task with skill, who spoils the job and cuts prices. Satisfied workmen in love with their trade are what the craft wants. The craftsmen of tomorrow are the apprentices of today and the employers of to day's apprentices are the moulders of the craft of the future. And the future of the craft demands that the master smith give "his boys" every possible help, guidance and assistance that lies within his power.

#### A Wrought Iron Lamp and an Ornamental Entrance Gate.

Every city or town of prominence has its palatial and imposing residences and few indeed are these structures that do not contain in either house or grounds some example of the art smith's work. Here we find an artistic gate, there an exquisite screen, here a beautiful lamp and everywhere on boulevard and avenue we find marks of the art iron-worker's magic hammer.

The accompanying engravings show two examples of Buffalo art work. The wrought iron lamp, while very simple, is still very artistic and shows what can be done by avoiding the very showy design so often encountered in art iron work. The lamp support has just sufficient twist and scroll to it to relieve

the otherwise stiff effect. The drive gate is a pleasing combination of scroll and straight-bar work and is of an especially handsome design. The cope of the gate is a very beautiful example of leaf scroll work and adds much to the general effectiveness of the structure.

#### How to Sharpen a Lawn Mower.

BY A VILLAGE BLACKSMITH.

At this season of the year the song (?) of the lawn mower may be heard at all hours of the day and, as usual with most all machines, when out of repair or in need of sharpening it is brought to the blacksmith. The smith not having a regular grinder, is often sadly perplexed to know how to do the job. One will try filing the knives and cutter bar; another will try grinding the knives on the grind stone after removing them. But these methods are unprofitable, the first one costing too much in files, and the second method costing too much time. The way we do in our shop is as follows: Turn the mower on its side (the driver side up) and remove the drive wheel. When this is removed, you will notice a small cog pinion in the hollow side of the mower. Remove this pinion, and at the same time watch for the dog that works back and forth in the shaft. Now reverse the position of this dog, replacing the pinion and also the drive wheel. Now push the mower forward and see if the knives turn backward instead of forward. If they do not, the dog has not been reversed; if they do, look at the knives closely to see if they make good contact the full length of the cutter bar. If they do not, arrange them so they do. Now, with the machine right side up, pour some heavy bodied oil on the cutter bar in front of the knives. The oil should extend the full length of the cutter bar. Now take some powdered emery, about number 80 and with an old spoon, pour a quantity on the oiled cutter bar. Now turn the mower upside down and push



AN ARTISTIC ENTRANCE GATE ADDS MUCH TO THE APPROACH.

it forward. About three applications of oil and emery and ten minutes of vigorous pushing will bring the knives to a nice cutting edge. For a job of this kind we get twenty-five cents. We have been using this method for three years, have made quite a nice sum and have yet to find a dissatisfied customer.

#### A Large Shoeing and Repair Shop.

E. L. REED.

The several engravings show interior views of the Employer's Teaming Company's repair and shoeing shops at Chicago. This company operates two shops for the shoeing of its 300 horses and also has its own repairing and painting departments for giving proper attention to the 170 wagons which it now operates. The picture of the shoeing department is a view of what is called the second floor shop and shows that things are generally kept in "ship-shape." The horses shown are a fair example of the animals used by this concern—most of the wagons being of the two-horse variety. The second picture shows a gas tire heater in operation with a tire cooler in the fore-ground. The third engraving shows the forge of the repair department and shows the men at work at welding a tire. Here again is the orderly arrangement of the shops illus-



A BUSY CORNER IN THE WAGON REPAIRING DEPARTMENT.



ANOTHER VIEW OF THE WAGON REPAIRING DEPARTMENT SHOWING GAS TIRE HEATER IN OPERATION.

trated. Note the rack on the left for the various cutters, flatters and swages, also the case for nuts, bolts, screws and such like against the wall in the rear of the shop.

The work of the company's teams consists chiefly in the cartage of heavy freight requiring regulation stake trucks. Between fifty and sixty coal wagons are also operated. The business is conducted from three different barns and the operations of the company extends to all parts of the city.

#### Wagon Lettering for the Vehicle Painter.—2.

F. L. MARVIN.

Before going farther with this series of articles, let me caution the prospective letter-artist not to depend too much upon guide lines or other mechanical aids. These tend to make the eye of the letterer less accurate and the ease and skill of a free hand is much preferred. The average reader will perhaps at first be unable to do very good work without the guide lines, but he should be careful not to lean on them too heavily or he will find his confidence gone when their support is removed. Better to take a little time in the training of the eye and hand, than to simply do what the hand is already capable of doing—to follow a line or mark.

In practicing the letters of the alphabet, the student will have noticed that the letters A, E, F, H, I, K, L, M, N, T, V, W, X, Y and Z are by far the

simplest. All of these are made up entirely of straight lines. The letters A, K, M, N, V, W, X, Y and Z demonstrate the necessity of fully mastering the slanting strokes, which will also be found helpful in forming the letters containing curves and parts of circles. These letters will be taken up later.

When studying the formation of the straight line letters, it would be best to practice the simpler ones first. These we find are I, T, L, H, F and E. The formation of the I is simple and needs no explanation. The T is formed by making the cross stroke first and the dropping an I directly from the center of it. In making the L, the "pillar" or perpendicular stroke is made first and

then the "foot" or cross stroke at the bottom. The H, F and E are made by executing the "pillars" first and then the cross strokes. The cross stroke in the letter H is not directly in the center, but just above it and the same thing will be found true of both the F and E. The upper stroke of the F is made slightly longer than the other crossstroke. The E is made exactly the same except for the addition of the cross stroke at the bottom which is made slightly longer than the top cross stroke.

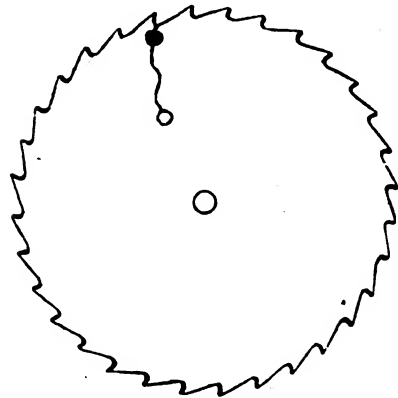
It is understood, of course, that the would-be letterer is to first outline these letters and then to fill them in and under no circumstance is the novice to attempt filling in before the entire outline of the letter has been formed. Strict adherence to this rule will go a long way toward preventing careless lettering and slipshod methods.

We now take up the slanting stroke letters, the formation of which we will endeavor to simplify by brief explanations. The A, V and W are so closely related that we can consider them in a group. Perfect mastery of the slanting stroke is absolutely essential in their formation and aside from a caution not to get the W too wide, there is little to be said. The cross stroke of the A should be below the center of the letter. In forming K, the pillar stroke is made first, then the upper slant down toward the pillar, joining it slightly below center and finally the lower slant, which should project slightly farther out than the upper slant. The M and N are formed by making the pillar strokes first and then, in the case of the M, a modification of V and in N a right slanting stroke, to join the pillars. The width of the M is slightly greater than the regular letters but not so wide as W. The letters X, Y,



THE SECOND FLOOR SHOWING SHOP WHERE ONE HUNDRED FIFTY HORSES ARE CARED FOR.

and Z are now the only straight line letters that have not been considered. The X consists of two slanting strokes crossing each other at the center. This letter appears very simple but care must be exercised to get the same degree of



REPAIRING A CRACKED CIRCULAR SAW.

slant in each stroke. The letter Y consists of a small V extending for about two-thirds the space, with a small pillar to support it on the line. In forming this letter, be sure to have it evenly balanced. The left side has the same degree of slant as the right side. The letter Z is simply two cross strokes with a left slanting stroke to connect them.

(To be continued)

### Two Handy Kinks for the Smith.

GEORGE NABLO.

The ingenuity of the smith is often sorely taxed, and it is with the thought that they may help some brother out of a difficulty that I submit the two following kinks. A cracked circular saw, such as shown in the engraving may be easily repaired and again made quite serviceable by the following method: Drill a  $\frac{1}{4}$ -inch hole at the crack near the teeth and another hole at the end of the crack. Now countersink the hole near the teeth on both sides and insert a rivet very neatly, finishing the heads of the rivet down even with the saw blade. Should the crack be an extra long one, two rivets may be necessary.

To smooth a rough gun barrel, take a stout hardwood stick, somewhat longer than the barrel of the gun and of a size to slide into the barrel easily and cut a dovetailed slot in one side of it to receive a half round file. Now insert the file in the slot and scrape or grind the barrel as much as necessary. Strips of thin cardboard between the file and the stick will keep up the proper pressure. After filing, a perfectly smooth finish can be obtained by the use of emery flour. A gun barrel can also be made choke-bore by using this method.

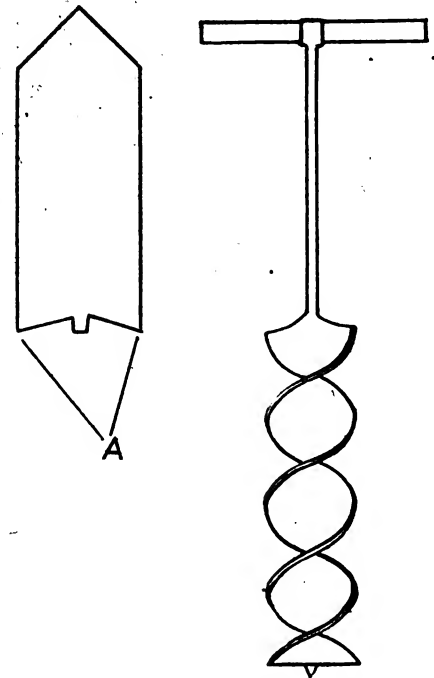
The exchange of methods and ideas through this journal is certainly good for the craft and I hope that brothers will continue to write.

### How to Make a Post-Auger.

S. ANDERSON.

Out here on the prairies where I am located, wood is scarce so we must use a great deal of two by four-inch lumber for fence posts. Making the post holes with a six by eight-inch post digger is no easy job and it therefore occurred to me to scheme out an easier way. I consequently made a post-auger as shown in the engraving. This auger received first premium at the county fair. I will endeavor to explain how it is made, as I think some of the brothers may be interested. I use 3 by  $\frac{1}{4}$ -inch soft steel for the auger, taking a piece  $3\frac{1}{2}$ -inches long. I then cut it as shown, and then sharpen the wings AA, not attempting, however, to finish the spur. I then take a piece of  $\frac{3}{4}$ -inch round stock 30 inches long and forge a handle hole in one end of it. I now weld this round piece onto the auger blade and then heating the blade, twist it in the vise (to the left). Now finish up the cutting edges over the horn of the anvil and make the spur a square point. I have made fifty augers of this kind and have even sent some of them out of the state.

work securely. Their proper shape depends upon the work to be held; whether of a uniform size and shape or of a general character. In the case of the former they may be made to exactly fit the special work. In the latter case they must be shaped to suit as wide a range of work as convenient. Suppose for example, the tongs are for use on a special size and shape of work; they should then be shaped as at A, Fig. 1, the



HOW TO MAKE A POST-AUGER.

### Tongs: Important Tools of the Smith Shop.

C. R.

Of all the tools used in the smith shop tongs are the most abused. The reason is that the smiths' stock of these very necessary tools is often limited to but a few pairs and when any one of them fails to fit some peculiar job he changes a pair until they do. He generally heats them to do this, but even this is sometimes neglected and a broken jaw is the result, thus making their repair necessary and

jaws gripping the work evenly and uniformly. The ends of the handles of these tongs should be slightly curved to prevent the ring from slipping off. Should these same tongs be used on work of greater thickness, they would grip at the inner end of the jaws only, as at B, thus making a solid grip on the work impossible. The tongs for general work are therefore shaped as shown at C, the

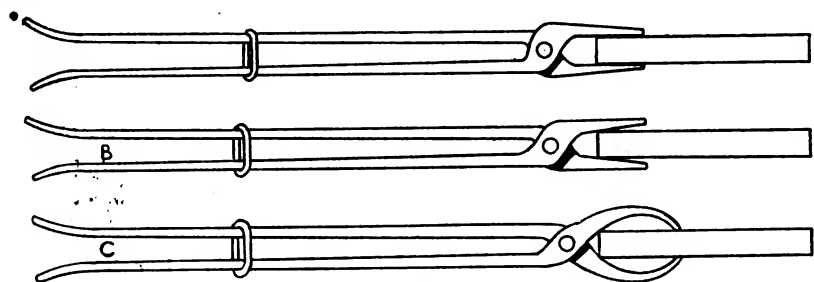


FIG. 1.—THE CORRECT AND INCORRECT METHOD OF FITTING TONG JAWS TO THE WORK.

the labor of repairing two tongs is quite as much as it would take to forge an entire new pair.

Tongs are easily forged and as it is unnecessary to put a finish on them, their main requirement is to hold the

jaws describing an oval and the work being placed in the jaws sufficiently to be gripped by their inner edge and also at their tips.

The reader will undoubtedly have noticed that the jaws of the tongs in the



engraving are tapered instead of being of one thickness. There are several reasons for this, and despite the fact hammer will hit with half its face over the edge of the anvil. Now pull it across the anvil, giving it a half turn toward

of the handles as shown at D, Fig. 3, thus forming a good clip puller which can also be used for holding plow bolts.

After taking the jaws of your tongs, the next thing is to put them together. Place the jaws in proper position upon each other, leaving space between them for the work and mark the rivet hole. This is then drilled and a hot steel rivet inserted. The tongs are now heated and worked and if you have done your work properly, the tongs will do their work to the best of their ability.

The tongs shown at E, Fig. 3 are bolt tongs. These are not strongly recommended, but they are very easily and quickly made and will answer their purpose very well. They are forged same as flat tongs, the jaws being made almost square and split for about  $\frac{1}{4}$  or  $\frac{3}{4}$  of an inch in each tip. Fig. 3, F shows a better shape for bolt tongs. They are forged as shown at G, the bent piece as shown by dotted lines, being then forged as at H, using a V shaped tool to shape the groove. Now bend as shown by the dotted lines at J and finish. At K, Fig. 3 is shown a pair of pick-up tongs. These are forged the same as flat tongs and the jaws are then bent as shown in the engraving.

One may almost say that a smith is known by the condition of his tongs.

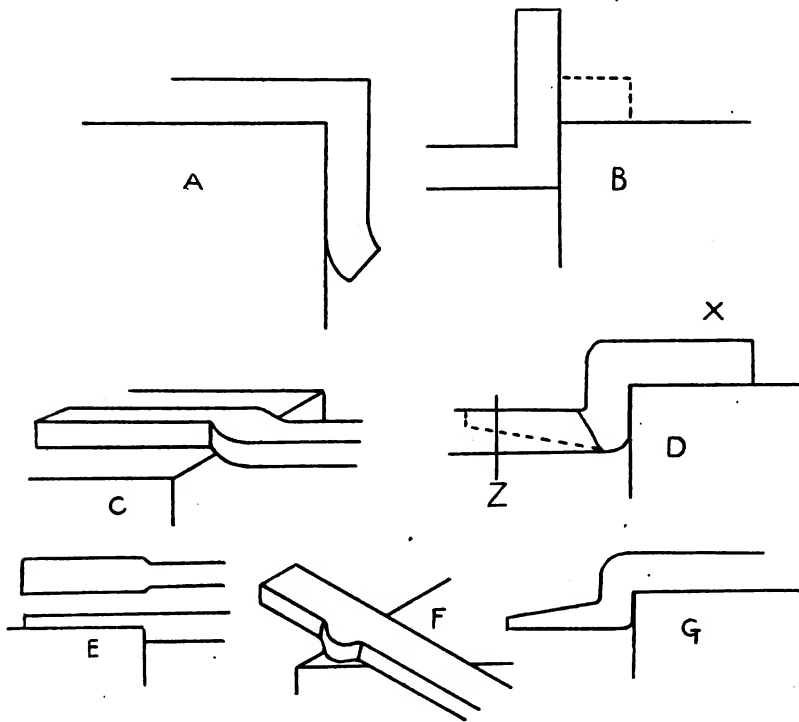


FIG. 2.—THE MAKING OF A PAIR OF TONGS IS NOT AN EXACTING OPERATION.

that many smiths forge the jaws of their tongs of even thickness, better results will be obtained by a reasonable taper.

To forge a pair of common flat tongs, take a piece of Norway iron about  $\frac{5}{8}$  of an inch square and bend one end of it over the outer edge of the anvil, Fig. 2, A. Then bend the piece over the inner edge of the anvil as at B, taking care not to make the shoulders too long. Now place the piece diagonally over the anvil as at C, with the left hand toward the heel of the anvil when forging a right hand jaw and toward the horn of the handle for a left hand jaw. Now place the piece on the anvil as at D and draw out the stub X, weld a handle on this stub and cut off the jaw at Z, tapering it to the required size as shown by dotted line. The jaws are now shaped as wanted for either special or general work.

Another method and one practised by many smiths is to forge the jaws as shown at E, F, G. First draw out the end as at E, then hold the piece diagonally across the anvil as at F and then push the piece over the edge of the anvil and forge as shown at G.

And still another method is that shown at A, Fig. 3. This is to take a piece of Swedish iron about  $\frac{3}{4}$  of an inch square and hold it on the outer edge of the anvil with the left hand a little toward the heel of the anvil. Now strike so that the

yourself and forge the jaws as shown at B. Now split the piece as at C and finish the jaws. It is good policy to finish the ends

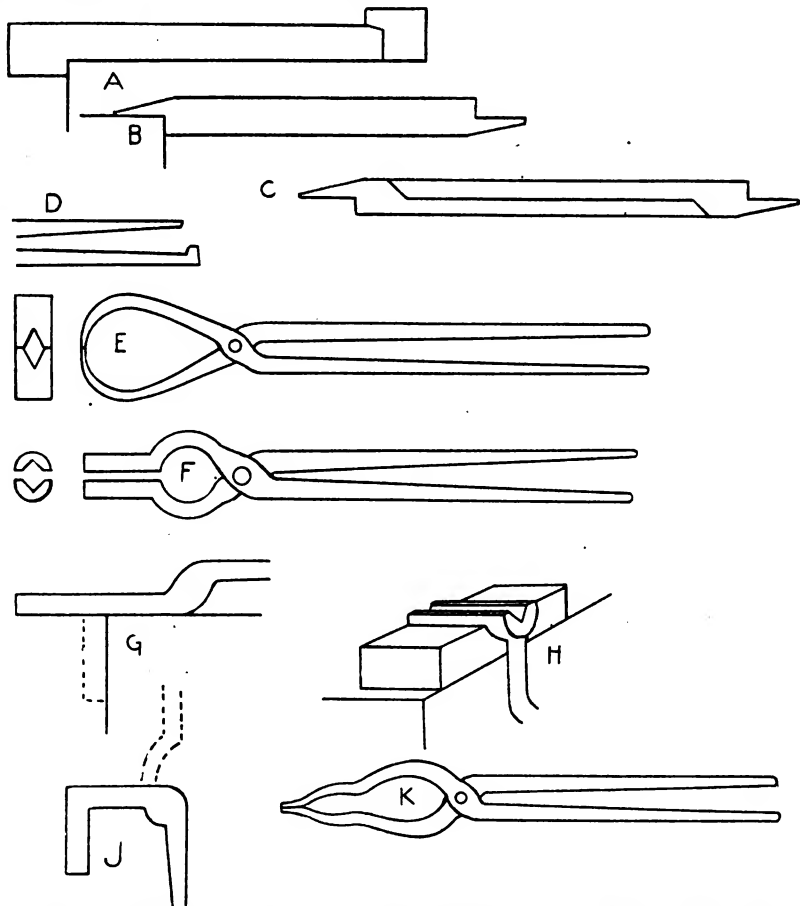


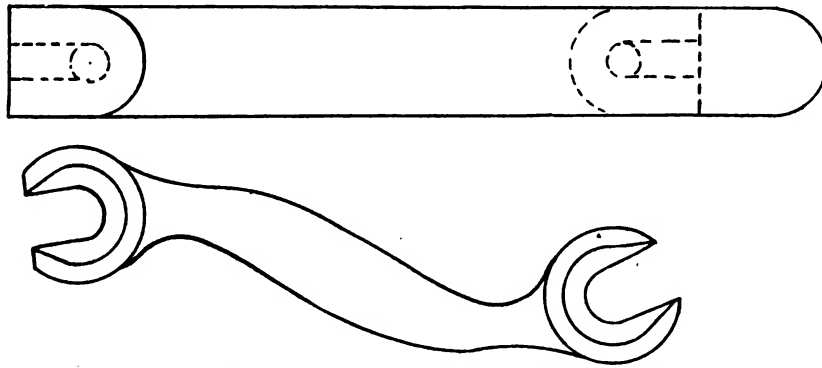
FIG. 3.—A SMITH IS KNOWN BY THE CONDITION OF THE TONGS HE KEEPS.

For surely the progressive and up-to-date smith will see the advisability of keeping his tongs in proper condition always, and to forge new ones when they are needed. It is certainly poor

of this strip is shown at A. I then made two standards as shown at B. These may be made of  $\frac{1}{2}$ -inch stock bent to shape with holes bored in the bottom of the U's for the reception of the bolts to

start a man to "scratching his head." I do not lay down any prescribed rule for this work, just simply tell how we sometimes do. If there is welding to be done, the parts to be welded should be heated up in the fire and the covering, whether nickel, copper or enamel, should be filed off far enough back so that it will not run into the lap when welding. If you use the same fire it should be cleaned out before welding. I make it a point to use the lap weld when I can; and after welding, cool one end, screw the other into the vise and upset in the weld. If it is not perfect, it will show up. Then take another welding heat and finish. This is the way we repaired an axle that was made of steel tubing. When it came to the shop it was bent at an angle like B. We cut it off with a hack saw at A. The part B was heated up and turned back straight, and the cold shut was worked out with a taper punch and swaged around smooth. The shaft D, being the size of the inside of the tube was placed as shown by dotted lines at C and the ends brought together as at E, and pinned. The work was then brazed and after it was cold, the crack was filled with solder, then smoothed off with a file and painted.

Should there happen to be any bent brass rods or tubing, heat the part to be straightened to a very low red, quench in cold water and then straighten cold. Care should be taken not to do too much at one anneal. For instance, if a



THE "S" WRENCH IS A HANDY TOOL FOR THE CARRIAGE SMITH.

economy to use a pair of tongs until they fall to pieces. A good method is to examine all the tools occasionally and repair them, so as to have them in working order at any time.

#### Wrenches for Carriage and Buggy Work.

C. P. LAWRENCE.

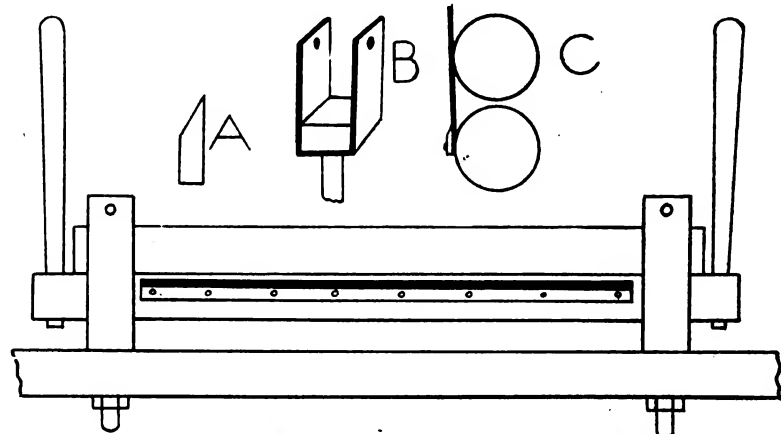
Probably the handiest style of wrench for general buggy and carriage work is that known as the "S" wrench. Every repair man will do well to keep a few of these for various sized bolts on hand always. They are very easily made and the home-made brand are generally found superior to the ones found in the hardware stores. I forge mine as follows: Take a piece of buggy spring or steel tire of suitable lengths and round both ends. Now bend each end about one inch from the edge and fold back and weld down; see A in the engraving. Now punch a hole in the thicker part at each end and cut out portion of the piece from the hole to the end of the wrench. The slots for gripping the nuts are now made the required size, the wrench slightly bent as in the engraving and then ground and finished.

#### A Home-Made Seaming Machine.

A. BOND.

A very simple machine for seaming stove pipe is shown in the accompanying engraving. One that I made for my own use works very good. I secured two pieces of boiler tubing— $3\frac{1}{2}$  feet and 4 feet in length respectively—and bored a hole in each of the longer tube, for the reception of levers. I then screwed a piece of thin steel plate 3 feet long onto the longer tube in such position as to leave each end of the strip equi-distant from the ends of the tube. An end view

hold the machine solidly to the bench. A block of wood in the bottom of each U will keep the bottom roller of the machine off the bench top and allow for easy manipulation. The standards also have holes bored in the upper end of each branch of the U. The standards are now bolted to the bench at a distance of about 3 feet-2 inches apart and the longer roller placed in position in the standards in such a manner so that when the strip of steel is toward the outer edge of the bench the beveled edge of the strip will point upward. The second tube or roller is now placed on the first one, bolts inserted in the holes at the top of the standard and with levers



A SIMPLE MACHINE FOR SEAMING STOVE PIPE.

in position on the longer roller the machine is ready for use. The sheets are placed in the machine as shown at C.

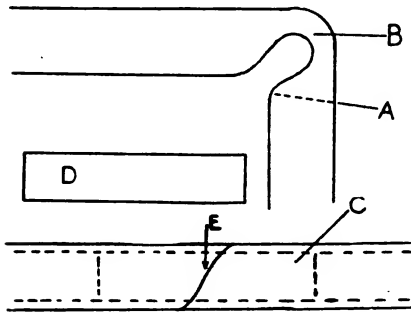
#### A Short Talk on Repairing Automobiles.

DAYTON O. SHAW.

A touring car drives up to the shop for repairs. It may be a broken spring; it may be one thing it may be another, but it is most often something that will

rod was bent to an angle of  $45^\circ$ , to straighten it, I would anneal and bend one half back, then anneal again and put it straight. In places where we cannot weld, it will be necessary to braze. Whenever there is a chance I rivet the pieces to be brazed, and when I can't rivet then I use clamps. Some men seem to think that brazing is not strong, but a good braze is stronger than a poor weld. I have in mind one instance

where I used both welding and brazing. Some thin parts were to be joined to a



THE REPAIRING OF AUTOMOBILES IS COMING TO BE PART OF THE SMITH'S BUSINESS.

thick part with a space between. The three parts were riveted together, the end was welded and the bottom brazed.

### A System of Forced Engine Cooling.

E. E. MERCER.

The problem confronting the average gas engine owner in winter is how to keep his engine in running order and how to get the most working force from his fuel. I will try, by means of a diagram and an explanation, to make clear a kink which I used during the past winter and which worked with perfect success. My engine never failed to run when I wanted it and when I closed shop at night, I had no fear that a bursted tank or cracked jacket would greet me in the morning. Since the weather has warmed up, I still continue to use this method, as I find I use about  $\frac{3}{4}$  as much gasoline as with the old method.

The accompanying engraving shows my device to consist of a water tank under the floor of the engine room, a pump, three or four lengths of pipe, a water glass and several valves. The pump is made as follows. Two check valves at C, one at each end of the cross arm of a T made of one-inch pipe. The perpendicular arm of the T is 12 inches long with an internal thread in the open end for about two inches. Now thread a piece of round stock to fit the thread in the end of the pipe, after first drilling a  $\frac{3}{8}$ -inch hole through it. This piece may be about  $\frac{3}{4}$  of an inch long. Now drill a  $\frac{3}{8}$ -inch hole exactly in the center of a pipe cap of the right size to fit on the end of the pipe. For the plunger take a piece of  $\frac{1}{2}$ -inch mild steel and weld it on the end of the pump rod of  $\frac{1}{8}$ -inch stock. To assemble the pump, place the  $\frac{3}{8}$ -inch piece on the pump rod, insert the plunger in the pipe and screw the  $\frac{3}{8}$ -inch piece into the pipe as far as it will go. Now pack your stuffing box with wick-

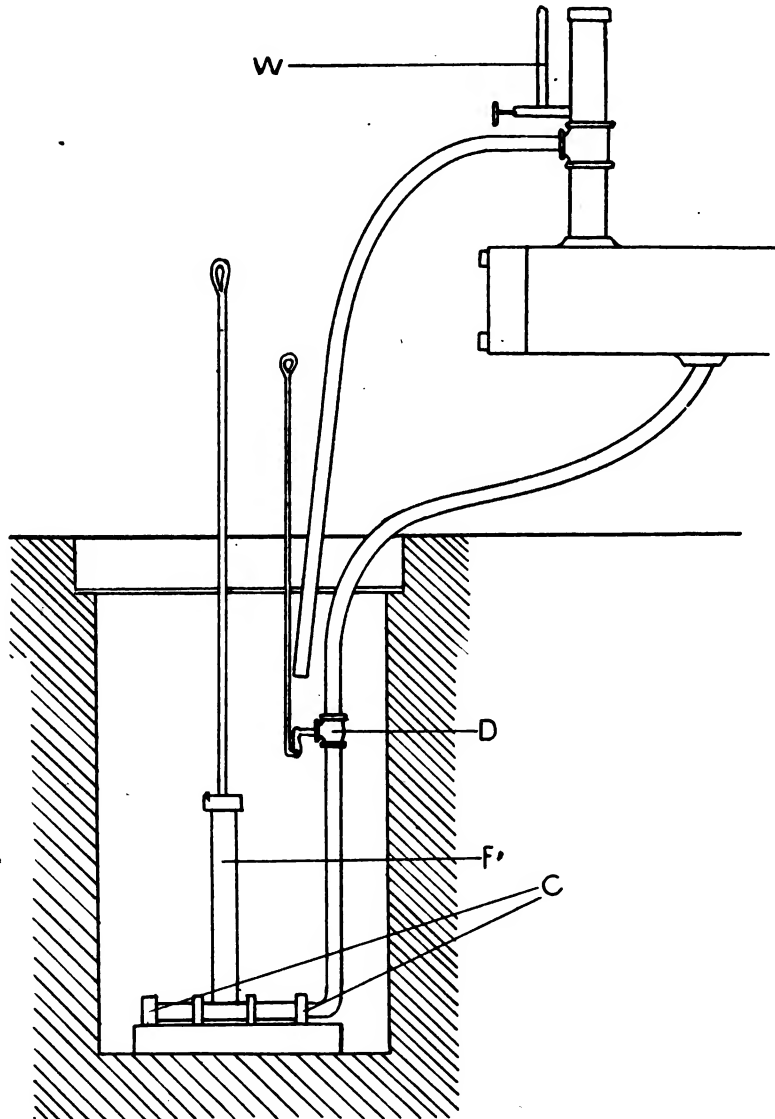
quantity of common yellow soap. Now screw the pipe cap on the end of the pipe. I now buried my water tank in the ground under the engine room, so the top of the tank would be a foot below the surface and after connecting the water supply pipe and the overflow pipe as shown in the engraving, I filled the tank half full. I made a cover for the tank and also one for the hole in the engine room floor. This left an air space of about 12 inches between the two covers. The water in this tank was above a freezing chill all winter. In forcing the water through the water jacket of the engine, I removed the dirt accumulations of the two years when the engine had depended upon gravity for water circulation. The

cock is of such construction as to not interfere with the flow of water to the engine, but when the cylinder jacket is to be drained a turn of the handle will allow the water to flow out.

### Don'ts for the Craft.—2. For the Horseshoer.

H. K. M'NAIR.

- Don't pare the frog.
- Don't rasp the wall.
- Don't burn the hoof.
- Don't fit the foot to the shoe.
- Don't rasp under the clinches.
- Don't cut the bars of the foot.
- Don't knock your neighbor smith.
- Don't narrow the heels of the shoe.
- Don't draw the toe calk out too long.
- Don't fit a shoe to the foot when hot.



A SIMPLE SYSTEM OF FORCED ENGINE COOLING.

water glass at W, acts as an indicator and by means of it I determine the working of the pump. The drain cock at D, enables me to drain the cylinder jacket at night and thus prevent its freezing in cold weather. This drain

Don't think that you are too old to learn.

Don't let the heels of the shoe, pinch the frog.

Don't forget that the frog never grows too large.

Don't punch the nail-holes so the nails will prick.

Don't think you know all about the horse's foot.

Don't lose your temper when shoeing a nervous horse.

Don't fail to level the foot before applying the shoe.

Don't put heavier shoes on the animal than are necessary.

Don't make the calk any longer than absolutely necessary.

Don't forget that a nail prick may mean the horse's life.

Don't forget that wet manure, mud or clay will soften hard hoofs.

Don't forget that a side-weight shoe will generally cure interfering.

Don't weld on the toe calk before bending the heels slightly together.

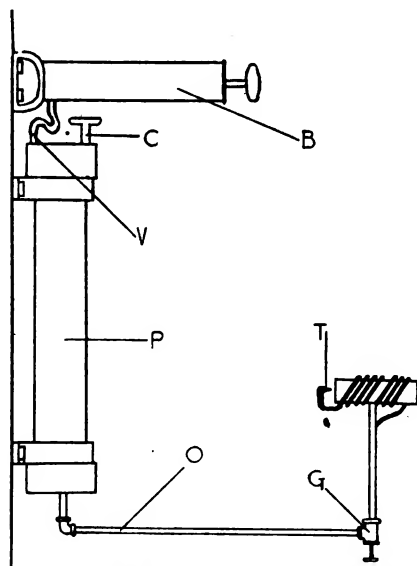
Don't forget that coaxing a horse brings more trade than kicking him.

Don't fail to get a good shoeing rack if you have many vicious horses to shoe.

Don't weld the toe calk before slightly bending it to conform to the shape of the toe.

Don't fail to note irregularities, faulty conformation and the gait before treating.

Don't forget that a healthy foot to stay healthy must have plenty of frog room.



EVERY GENERAL SMITH SHOULD HAVE A BRAZING TORCH IN HIS SHOP.

Don't talk too much about your work, let the work itself do most of the talking.

Don't hold the heels of the shoe too close to the anvil when drawing the toe calk.

Don't forget that the foot of the horse should come as close to the ground as possible.

Don't forget that some horse owners

know more about horses than some horseshoers.

Don't fail to take advantage of every opportunity to learn more about the horse and his feet.

Don't hide your knowledge under a bushel—if you can do certain things well, advertise the fact.

Don't dip the toe of the shoe into the sand when ready to weld—sprinkle the sand on the toe while in the fire.

### How to Make a Gasoline Brazing Torch.

B. TORCH.

I will try to tell how I made a gasoline brazing torch. This torch is made to fasten to the wall in front of the work bench and is fixed so as to swing back out of the way when not in use. Take a piece of 2-inch gas pipe, 2 feet long, P, and thread each end. Now take a 2-inch cap and drill a hole in it to receive a single tube bicycle valve V, also drill a hole and tap it to receive a  $\frac{1}{4}$ -inch pipe C, 5 inches long. Onto this 5-inch piece weld a piece of iron to form a handle or T, by which to replace this piece after filling the tank by way of the tapped hole. This cap is fitted onto the top of the piece of 2-inch pipe. The cap for the bottom is drilled and tapped for a  $\frac{1}{4}$ -inch pipe O. This is 2 $\frac{1}{2}$ -feet long and threaded at both ends. At G, is shown an angle valve for controlling the supply of oil to the burner. The burner is made of a piece of bicycle tubing with a piece of small sized tubing 2 feet long coiled around it. This arrangement causes a continuous generation of gas by the blast. A cap T, at the end of the coiled tube should have a hole not much larger than a pin prick. A bicycle pump, B, fastened to the wall just above the tank is used to keep up a constant pressure in the tank.

### A Simple Home-Made Bolt Holder.

W. R. GARMAN.

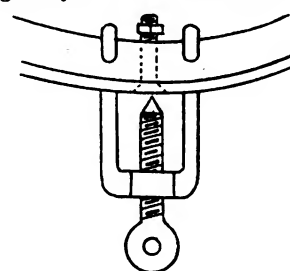
The accompanying engraving shows a simple style of bolt-holder which most any smith can make up, and if he is bothered with slipping, turning tire bolts, he will find his labors well repaid. The double hook is in one piece from any suitable sized stock. The bolt passing through it should be fairly stout and threaded. The point of the bolt is of steel and is made round like a center punch. The eye is made large enough to receive a half or three-quarter-inch bar. The hole in the crotch of the double hook is threaded to receive the bolt. The holder is now ready to be placed on the rim of the wheel, the bolt

screwed up tight against the tire-bolt and the tire nut removed.

### How the Pulley Was Bored.

A. J. PANTON.

I want to tell of a piece of work of last summer that taxed my inventive ingenuity for a while, but I finally made a good job of it. The idea will probably



A SIMPLE BOLT-HOLDER EASILY MADE.

help some brother craftsman over a like difficulty.

An iron pulley bored to fit a  $\frac{1}{2}$ -inch shaft was to fit a 2-inch shaft and

there was no machine shop nearer than sixty miles that could do the job.

While studying over it I thought about an old negro blacksmith who, having a cylinder of a forty horse-power engine to bore out, planted the cylinder in the ground and built a strong frame around it. He then got a block of wood dressed it round so that it filled the cylinder perfectly and put a lever on it as on a cider mill. Then he took a piece of tool steel as long as the diameter of the cylinder, drew out both ends and tempered them like a lathe tool. He then drew out the steel as much as the cut to be made in the cylinder, mortised a hole through the block and wedged the piece of steel in. With the help of an ox and after two days of steady grinding he made a fairly good job of it. I thought if he could do that I could certainly bore out a pulley. So I took an old  $\frac{1}{2}$ -inch axle and punched a  $\frac{1}{2}$  by 1-inch hole through it about midway of the journal. I then took a piece of steel the same size as the hole and 2-inches longer, ground it on the emery wheel like a cutter at both ends, leaving one edge longer than the other and the top longer than the bottom, so the short edge would go into the hole and the longer edge cut it to the right size. Then I put a block of wood next to the shoulder on the piece of axle, rounded it up to exactly 2-inches and then put my cutter through the axle. I then put another block on the axle and screwed on the nut. The last block was finished to the size of the hole so that it would just go in. I then placed the pulley down on a sill after boring a 2-inch hole to let lower end of the cutting tool go in after it went through the pulley. I now made a frame of



scantling a little higher than the piece of axle. By using a bolt threaded for about 6-inches to get the pressure, a  $\frac{3}{4}$ -inch rod for a lever through the pinhole in the axle, I bored the pulley out as good as it could have been done on a lathe.

### A Few Good Cold Chisels.

W. P. W.

The cold chisels shown in the engraving were made of Columbia Chisel Steel, by The Columbia Tool Steel Co. of Chicago Heights. The chisel at top is driven through a piece of soft steel 1-inch thick. The chisel is about  $\frac{3}{4}$  of an inch wide by  $\frac{1}{2}$  of an inch thick at the point, and  $1\frac{1}{2}$ -inches back from point measured  $\frac{1}{8}$  of an inch thick by  $\frac{3}{4}$  of an inch wide. The two small chisels were made from air hardening steel. They were drawn down very slim and driven through a piece of soft steel  $\frac{3}{4}$  of an inch thick. The others were driven through pieces  $\frac{3}{4}$  of an



IT REQUIRES SKILL TO FORGE A GOOD COLD CHISEL.

inch thick. They were also made very slim.

A cold chisel looks to be a very simple tool to make, but it takes considerable skill to make a good one. It is a tool that is subject to a great deal of abuse by the average workman. Here are a few good hints on making chisels. First, use a good reliable steel suitable for chisels. Next, in forging, heat slowly to a good bright red, and with fairly heavy blows draw the chisel down to the

desired shape, but leave it a little narrower and thicker than you want it when finished. Now reheat it to a dark red, and with heavy blows at first, gradually lighter and quicker as the piece cools, thin it down to the desired thickness doing as little hammering on the edge as possible. Do not hammer any after the piece has turned black, or when black spots appear in it, as this will crush the grain. Now, reheat to a very dark even red and lay in a dry place to cool. This helps to relieve the strains you may have caused by hammering. To harden, heat the chisel up evenly to as low a heat as it will harden at, for about 2 inches, then cool it off in the usual way in a bath of brine or clear water. Now polish it and temper in the usual way, letting the temper draw as slowly as possible to the desired degree, which may be ascertained by using a fine file. A fine file should take hold of a chisel made for ordinary work quite freely.

The chisels made of air-hardening steel are hardened in the usual way, that is, heated to a bright red and laid down in a dry place to cool. They are then polished and the temper drawn by holding them over the fire or laid on a hot plate. The chisels shown in the cut were drawn to a purple. They are only suitable for very light chipping, (chisels such as are used by die makers). The head or part to be hammered on should be heated to a dark red and allowed to cool slowly.

When forging cold chisels do not under any circumstances hammer the metal after all traces of red are gone. Be careful in the heating and forging and you will have a chisel that will stand any amount of wear and usage.

### An Up-to-Date Pennsylvania Shop.

WM. H. GIESAN.

The accompanying engraving is an exterior view of my shop, which is fitted up with a four horse power Columbus gas engine; 24 foot line shaft; a circular saw; a band saw; a wood boring

machine; a jointer; a grind stone; an emery-wheel; a drill press; a power blower and a circular saw outside for sawing cord wood. I also have an



A NEAT-LOOKING SHOP IS A GOOD ADVERTISEMENT.

Enterprise meat chopper with which I chop meat for my neighbors during the butcher season. I can run this very conveniently and with profit. My engine I would not part with at any price if I could not get another. I am now considering the erection of a cider-making machine.

### A General Shop of Ohio.

GEO. W. TINKEY.

My shop is 24 by 30 feet with shed rear for storing stock, coal and wood, I do general custom work, horseshoeing, repairing, clip horses, sell the Wonder plow trucks, the Silcott tuyere iron and manufacture and sell the Blacksmith Friend tire setter. We have a great farming country and my customers are all worthy. I have run the shop for the last thirteen months and have not had to send out a statement, almost "solid" cash. The cash makes friends and people are not asking for credit. A smith has to work so hard that it would not be any more than right to not trust anyone and then you are sure the dead



A PROGRESSIVE OHIOAN RUNS THIS SHOP

beat won't get you. Every dollar you can't collect would be clear profit if you had it. Our town is booming, new blocks are going up and houses are scarce.

## Then do Right.

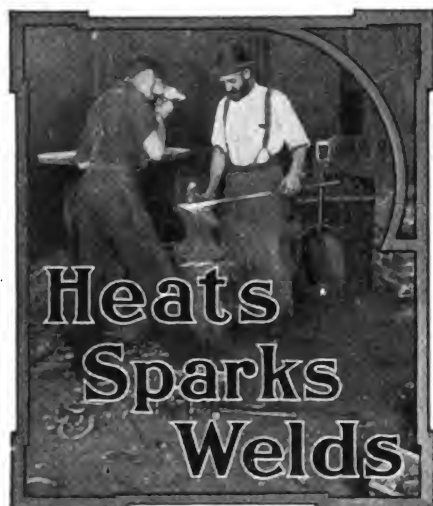
ANONYMOUS.

Would'st thou lead a useful life,  
Would'st thou miss a world of strife,  
Have thy bark serenely glide  
Smoothly down life's earthly tide,  
See the bright and sunny side?  
Then do right!

Would'st thou have of men good-will,  
Find a good in every ill,  
Pass along in goodly cheer,  
Never held in coward fear,  
Have a mind and conscience clear?  
Then do right!

Would'st thou save thy earthly form  
From diseases' blight and storm,  
Prosper without selfish end,  
Find in all a brother, friend,  
Each a helping hand to lend?  
Then do right.

Would'st thou truest friendship know,  
Would'st thou pure and holy grow,  
Every tempter wisely scan,  
Hold thy passions under ban,  
Rise a truer, higher man?  
Then do right!



An investment can always be afforded—an expense never.

His service to the world is what makes one man superior to another.

It isn't workmanlike to stick files up on end in the floor—nor safe.

Everyone is liable to make them, but let your mistakes be object lessons.

Some men are always over-worked but the community usually calls them grumblers.

The careful smith never starts any machine without first determining that everything on it is O. K.

He will never be a successful smith, who never has time to do the little things and to do them right.

You cannot buy one, order one made or dream yourself into one. You must hammer and forge your own character.

A German Consul says that 68,000 horses were killed in Germany for food purposes during the first six months of 1905.

"I keep as close to this rule as possible" said Thornton when giving this business maxim: "Buy for cash and sell on short time."

When not in use, lower the trough under the grind stone or there will soon be a soft spot where the stone touches the water.

How is your herd? Using the buffalos freely? Don't forget that we have lots of these little "pink animals" awaiting your call.

"I think it the most interesting book I ever read" says a practical Indiana shoer who purchased one of our books on horseshoeing.

Commodore Vanderbilt once said, "Never use what is not your own; never buy what you cannot pay for; never sell what you haven't got."

The fish landed and sold in British markets last year were valued at fifty millions of dollars. Of course some will call this a "fish story."

Remember—everything you send out represents and advertises you, your shop, your work. Therefore let everything be of the best; make it a credit to your business.

It is one of the biggest factors in business success. Whether you shoe his horse, sell him a reaper, grind his lawn-mower or paint his wagon, aim to give your customer a good, big, solid chunk of satisfaction. That's what will bring him back.

"The answer department alone will repay the subscription cost," says a California mine smith when sending his subscription. Are you getting full value from this department? Tell your neighbor if you are—if you're not, tell us. We can help you.

Why did Jones succeed?—"It pays to advertise" is the way Jones explains it. Of course some smiths are afraid they will be swamped with work if they purchase a half-inch space in the local weekly. Jones wasn't, and he used a half-page during Fair week.

On our way to the office, several mornings ago, we discovered a certain hard-working housekeeper, beating a carpet as though her life depended upon it. Not at all surprised that her husband wasn't doing it. His name is Tom and his shop was not yet open when we passed.

Don't be too ready to condemn the engine if it doesn't run the day you get it. Read the directions for setting-up and running, very carefully. If it still insists upon balking you may be pretty sure that something is wrong and that the manufacturer wants to know about it.

Like a ship without a rudder are the smiths without a county organization—entirely at the mercy of the elements upon which they depend for support. Today they ride on the stream of profit, tomorrow unwise competition takes them far out of their course into the sea of low prices. They continually encounter rocks of incompetent workmen, reefs of complaining customers and a continual mutiny of price cutting and contention. Plenty of men are there in the crew both willing and competent to take the helm, but no one to build the rudder of organization. Why pursue this endless voyage of bickering and strife? Why not appoint yourself boss-carpenter, muster the best of the crew and build the rudder which is to guide the ship-of-craft into

the harbor of harmony and better-prices? Take command today—it's easy sailing in summer. Write to the secretary, now.

The Swedish Ironmasters' Association reports for 1905 a remarkable year in the annals of the Swedish iron trade. The exports of pig iron, mostly free from phosphorus and to be used for malleable purposes, amounted to 110,400 tons, the largest quantity on record for any single year. The exports of ingots, bloom iron, and rough bars also show such a marked increase that with respect to them also it was a record year. Of still more importance to the Swedish iron trade was the fact that the rolled and hammered goods exported during the year reached unprecedentedly high figures. The total export of bar iron, small sizes, billets, steel of all kinds, tubes and parts of tubes, sheet iron, and bar ends during the year 1905 was 215,000 tons as compared with 193,000 tons in 1904. The production of pig iron in 1905 was 527,300 tons, a small increase over 1904, and of bloom iron 178,700 tons, a decrease compared with 1904, of Bessemer ingots 77,900 tons, also a decrease, while in Martin ingots the production was 280,200 tons, an increase of 35,000 tons. Martin metal continues to grow in favor in Sweden, while the employment of Bessemer metal shows a falling away. The iron industry is said to be suffering under the high prices for charcoal.

The consumption of aluminum has increased so rapidly that the world's supply at present falls far short of the demand. Many users of the metal are suffering great inconvenience without any immediate prospect of substantial relief. The world is dependent on four sources of production. The chief of these is represented by the Pittsburgh Reduction Company at Niagara Falls. There was a great demand on the Continent of Europe for this metal, and the result has been that aluminum ingots were quoted the 1st of April at \$850 a ton, or \$200 above the market price ruling last July.

Aluminum has come very prominently into use for castings, such as are necessary in electrical work, and an immense impetus has been given to the industry by the adoption of the metal for crank cases and gear boxes in automobiles. Aluminum is also very largely displacing copper for the manufacture of pans, such as are used in wax refining, jam boiling, etc. It is claimed that where brass can be used aluminum is, with rare exceptions, equally applicable, is equally economical, and has the great advantage of being about one-third of the weight. It will naturally be asked why the great expansion of demand for the metal has not been accompanied by a corresponding increase of production. The answer is that the producers have miscalculated the rate of progress, the present consumptive demand being very greatly in excess of that at the same period of last year. The rapid development of the motor-car industry is, no doubt, chiefly responsible. Aluminum is also being adopted for electric wires. For example the current from Niagara is being carried from the rapids to Syracuse by aluminum cables, a distance of over 160 miles.

### The American Association of Blacksmiths and Horse-Shoers.

The following extract of a letter received from a prominent Indiana smith should stir to action those of our readers who are located in an unorganized county.

"Have worked at blacksmithing for 25 years, and sometimes I become so disgusted that I feel like turning the business down forever. The great trouble with the business today (as I see it), is that the majority of the fellows following the trade are very lax in business methods, and are unfinished workmen, and to obtain work at all they are compelled to cut prices. What the blacksmiths of today need more than anything else, is to quit fighting among themselves, and ORGANIZE against those who are compelling them to work at starvation wages. Organize to have laws enacted for their protection. *Why! Just think of it. The common laborer, the man who digs ditches, has more protection than the blacksmith.*"

This smith with 25 years of experience knows the remedy for price-cutting for dissatisfaction, for low wages. Organization is the trade saver. Why not use it? Every trade craft, and profession has associations and organizations for their protection, why not the smith and wagon maker? If anyone earns his wage, it is the smith and there are few craftsmen who receive worse treatment at the hands of their debtors. The absurdly low prices received by the smiths in some localities are sufficient to disgust the best of craftsmen and smiths everywhere should give every support to organization movements.

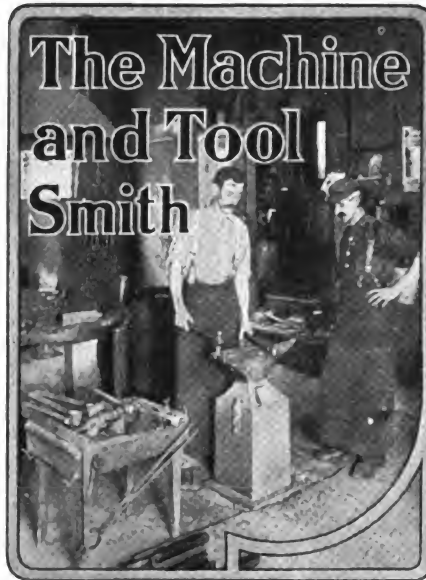
Call on your brother smiths and get their ideas on this matter. You will find them thinking of organization as just the right step for the betterment of the craft. Write to the American Association of Blacksmiths and Horseshoers for plans of how to form an association. These are free and besides you get our help. Just drop a postal card addressed P. O. Box 974, Buffalo, N. Y. and make clear your wants and by return mail you will receive the plans and other literature. But write today—NOW.

#### Curing a Toe-Crack.

M. W. WARREN.

I had a case some time ago, a description of which with the method of curing, may help some of the brothers who have a similar case in the shop. The horse in question had a crack down the front of his fore-foot, which was so bad as to make the animal practically worthless. It caused him much pain and conse-

quently continual lameness. My method of treatment was as follows: I took a piece of heavy zinc about two inches wide and three inches long and attached it to the hoof, right over the crack, with short screws. I then made a cut at the hair sufficient to draw blood. Then I shod the horse with a bar shoe. The horse was then worked and has never been lame since.



To restore steel that has been burned: heat almost to a welding heat, then mop it about in resin until it blazes. Then blow out the fire and work the steel gently. Repeat this several times until it is restored. If you are not successful the first time, let it cool and try again. I had a chisel that I had to work this way three or four times, but now it is as good as any chisel.

G. P. STOKER.

Take Time when forging tools from tool steel. Smiths in the large railroad and construction shops are liable to be rushed when making tools. Of course this rush and hurry reflects discredit on the smith in the way of worthless tools. Steel, and especially tool steel, should not be rushed in the heating and if, when required to forge any tools, proper time is taken, there will be less kicking and more tool satisfaction. Insist upon the proper time for tool making, then heat your tools properly and forge them properly.

W. H. N.

#### Hardening and Tempering Steel—9.

##### Examples of Hardening.

E. R. MARKHAM.

While a few general rules may be given it is not possible to give methods that are applicable to every case. For this reason it seems wise to give examples of hardening and select those which cover as broad a field as possible.

Let us first consider the hardening of a cold chisel—an instrument widely used

and generally abused. In order that a chisel may be a success, it must be properly forged at comparatively low heats, and hammered with *light* blows until it has cooled considerably below the heat ordinarily used when metal is displaced. The object of the light blows on the lowering heat is to "close the grain" of the steel making it tough and strong. I have found by experience that tools of this character stood up better if they were laid to one side and allowed to cool before they were heated for hardening. This is not always possible, but when it is, make the hardening heat a separate operation. The hardening heat should be the lowest possible, consistent with good results, and may extend one inch or so farther up than we wish to harden. The chisel should be dipped in the bath rather slowly to the desired depth, and then worked up and down and around to prevent a water line and to get away from the steam which forms around a piece of red hot metal held stationary in the bath.

A "Water line" is more apt to give trouble on tools like chisels which are subject to concussion than is the case with many other classes. It is caused by having a portion of the steel hard to a certain line and soft just beyond that. The contraction incident to the sudden cooling takes place up to this line, beyond the operation is much slower, hence a weakening of the steel at that point. Many times the piece will break at this point before it is taken from the water, or immediately after, or if examined will show a crack. This may be avoided by moving the article up and down in the bath while cooling. At times fire cracks and water cracks are confounded. If steel cracks in the fire or was cracked before placing in the fire, the walls of the fracture will be black, the heat having had a chance to color them. The walls of a water crack will be clear, or possibly stained by the water but not enough to cause them to resemble a fracture that is fire cracked.

As to the method of drawing the temper, custom differs. Some blacksmiths draw from the heat in the upper part of the chisel, while others equally expert claim better results if the tool is cooled off and the temper drawn by heat externally applied. I must confess that I have never been able to notice any difference when I have been equally careful working either way. I think a very common mistake consists in quenching in a bath that is too cold, thus causing greater brittleness than if quenched in one that was lukewarm. I

have often seen men plunge the chisel in cold water when it showed the proper temper color. I prefer oil and have found chisels much tougher when the temper heats were checked in it.

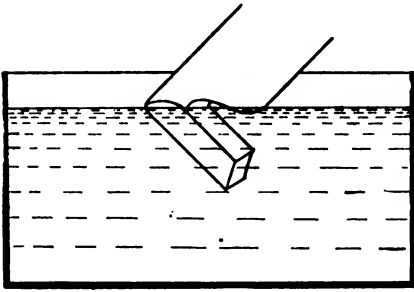


FIG. 1.—SOME HARDENERS DIP THE POINT OF THE TOOL ONLY.

A chisel used in chipping iron and steel receives rough usage and should be made from a good grade of steel especially adapted to such work. Realizing the rough usage such tools are subjected to, steel makers put out a special grade for this purpose which usually contains from .9 to 1.10 per cent. carbon. The percentage is high enough to insure good results and the head of the tool is not liable to chip and split as when high carbon steel is used. Tools that are to cut metals from the result of a blow, are generally made from a lower carbon steel than those that cut as the result of a steady pressure. For this reason lathe and similar tools are made from steel containing from 1.25 to 1.6 per cent. The higher the percentage of carbon the lower the hardening heat should be for pieces of the same size and shape. When high carbon steels are used for lathe, planer or milling machine cutting tools, higher speeds may be employed than when those containing a lower percentage are used. Consequently many up-to-

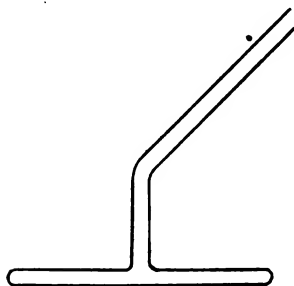


FIG. 2.—A BENT WIRE CAN BE USED FOR DIPPING CUTTERS.

tools should be heated to the proper temperature to insure the desired degree of hardness and *no hotter*, as the higher heat would render the steel brittle. They should not be quenched in an extremely cold bath as that also tends to make steel brittle without making it materially harder than if quenched in a lukewarm bath. The tool must be worked up and down in the bath to prevent a water line and around, to get away from the steam unless a bath having a jet coming up from the bottom is employed.

Custom differs as to the method of drawing the temper—some hardeners cooling the tool off entirely and drawing the temper by reheating over the fire, while others dip as shown in Fig. 1, leaving the shank red hot for a distance and then drawing the temper by the heat in the shank which readily runs into the lighter portion. As to the better method I confess that after numerous experiments I have failed to find that tools tempered by either one showed any better results than those treated the other way. A man generally uses the method that he has become accustomed to and considers it superior to the other. It is certainly a saving of time to draw the temper by the heat in the shank, but care should be exercised that the portion nearest the shank does not become too soft by the time the end has reached the desired temper, as in such a case the tool would be too soft to cut when ground down, and would require rehardening.

Tools that are properly heated and hammered in the operation of forging require less drawing of temper than those improperly treated and for light work I have used many times lathe tools for

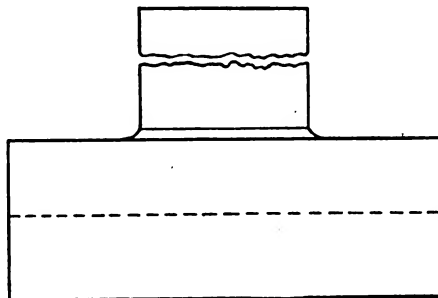


FIG. 3.—STRONG, HEAVY TOOLS NEED BE TREATED ONLY PART LENGTH

brings a much greater strain on the tool must be met by a tool that is necessarily weaker on account of the greater clearance angle. It is apparent that the utmost care must be exercised when making and hardening tools for such use. Milling machine cutters on account of inequality of thickness of the various portions call for extreme

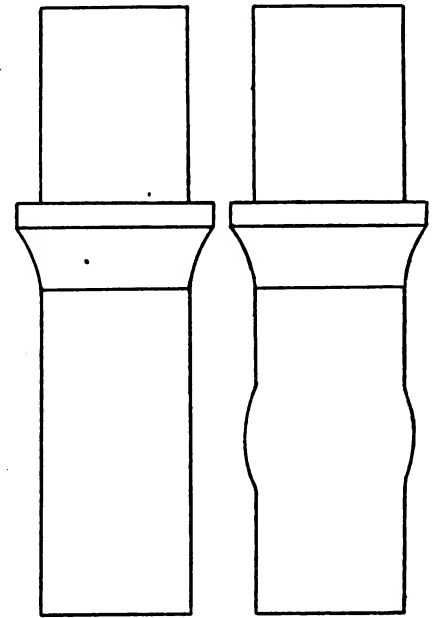


FIG. 4.—A PIERCING PUNCH FOR HEAVY STOCK. FIG. 5.—IF NOT HARDENED FULL LENGTH.

care when hardening. The lighter portions which cool more rapidly than the heavier parts have a tendency to draw away, thus causing a break in the steel, and it is not an unusual thing to see cutters that, when removed from the hardening bath, have parted company with two, three and perhaps the majority of their cutting teeth. This result rarely if ever takes place if the steel is properly treated.

Steel that contains strains when hardened is more apt to break than if the strains had been removed by *proper* annealing. This annealing in order to effectually remove the strains must be done when the steel is as nearly as possible of the form it is to be in when hardened. For instance a cutter of the kind under consideration should have a hole through it, and if it is irregular in form it should be blocked out nearly to shape before annealing. Under these conditions any strains that would manifest themselves when the cutter is hardened would be overcome when annealed. At times it is not possible to anneal to remove strains. In such cases I always heat the piece to the hardening heat (sure to have the heat uniform), then remove from the fire and allow it to

date concerns are using the article that allows them to produce the greater amount of work. However, it must be borne in mind that the higher the carbon contained, the greater the care necessary when heating as it is more easily injured by heat than low carbon steels. Lathe

cutting that were left "dead" hard: the temper was not drawn at all.

It is an unfortunate fact that tools which are to cut the coarsest feeds must be given a greater clearance angle than those for cutting fine feeds and as a consequence the coarse feed which



cool in the air. This precaution need not be observed when the piece is irregular in form, or where the conditions are such that irregular contraction would be

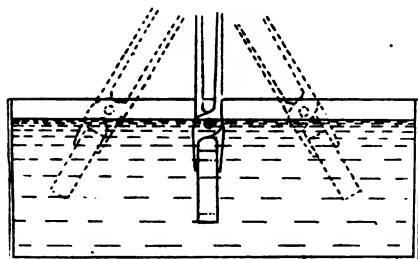


FIG. 6.—SWING THE DIE GENTLY BACK AND FORTH IN THE BATH.

liable to cause disastrous results. At times milling cutters have their teeth cut with a *sharp* cornered angular milling cutter; this is of course a mistake but the hardener has nothing to say about this as the mischief is done before he gets the cutter to harden. A *sharp* corner is always an invitation for the steel to crack when hardened. To prevent this, various expedients are resorted to; one consists in placing a small quantity of prussiate of potash in the sharp corners. The prussiate of potash should be in powdered form; after applying, the cutter should be placed in the fire long enough to allow the potash to melt and distribute itself uniformly in the corner. The cutter may then be removed from the fire and quenched in the bath which should never be *cold* water. Excellent results follow the use of *lukewarm* brine. As *uniform* contraction is to be desired, the cutter must not be held by means of a pair of tongs, in

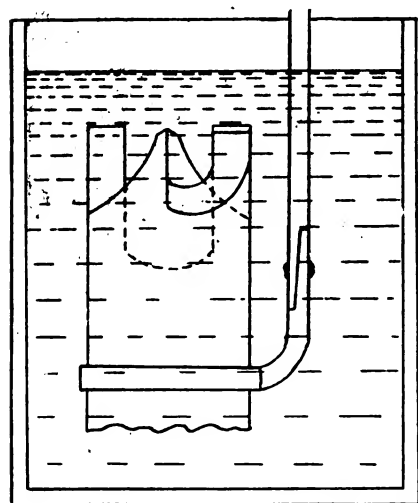


FIG. 7.—HOLLOW MILLS SHOULD BE HARDENED WITH OPEN END UP.

the bath, or in any manner that prevents the contents of the bath having free access to every portion. To accomplish this, a piece of wire of the from

shown in Fig. 2 should be used. The cutter should be worked up and down and round—not violently—in the bath and immediately plunged in the bath to prevent steam forming at any point. When the steel stops singing, it should be removed from the hardening bath, and immediately plunged in a tank of oil, where it should be left until it is cooled to the temperature of the oil. As the various parts of the cutter are of unequal thickness, unequal contraction is sure to result. But if the precautions mentioned have been observed these need give no annoyance up to the stage in which we now have the cutter. But these unequal strains incident to hardening are liable

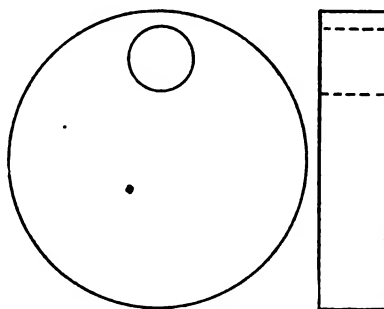


FIG. 8.—AN IRREGULAR PIECE IS LIKELY TO CHILL IRREGULARLY AND QUICKLY.

to manifest themselves unless they are overcome. This may be accomplished by reheating to a temperature of about 212° F. The reheating should not be rapid and may be done by holding over a fire, constantly turning the tool to insure uniform results. A drop of water may be applied from time to time. When this bursts into steam from contact with the steel, the cutter is warm enough and may be set to one side and allowed to cool. This precaution however need not be observed if the temper is to be drawn immediately after the cutter is taken from the oil, as the process of tempering allows the steel to conform to the interior strains and the outer surface being hot is yielding, to a certain extent. However, if the temperature is not to be drawn right, the reheating to overcome strains must be resorted to.

Many times it is advisable to harden a piece of work for only a portion of its length, and again to harden it all over, or the whole length of the portion that is to be subjected to strain. Take for illustration of the former, the punch shown in Fig. 3. This tool is so heavy and strong that it need be hardened only a portion of its length, the hardening stopping at dotted lines.

If the piercing-punch shown in Fig. 4 was to punch heavy stock, then it would

be necessary to harden the whole length of it, or it would spring or buckle as shown in Fig. 5. Light punches that are to be used in punching comparatively heavy stock should be left as hard as is consistent with good results—everything being equal—as in such condition they are less liable to spring. A common mistake when tempering such work consists in drawing the temper to a blue part way down, then to a full straw, brown color or possibly somewhat lower the balance of the way. Tools of this kind should be of a uniform stiffness the *entire* length of portion of the punch to be subjected to strain.

At times punches of the kind under consideration are left soft, but that is a

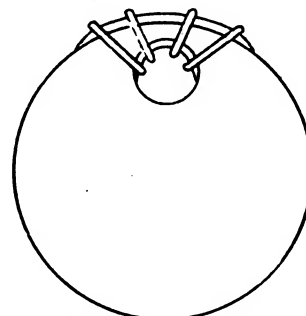


FIG. 9.—PIECES OF SHEET STEEL MAY BE BOUND ON THE LIGHT SIDE.

matter to be left to the one in charge of the individual shop, and if it were to be discussed would naturally come under Construction of Punches and Dies, rather than in an article of this kind. Dies that are to be used in connection with the punches shown, are in some shops, made of a grade of steel low in carbon, while in other shops high carbon steel is used, the *low* carbon giving best results where careless operators are employed to do the hardening, but, where the punch is to be used in producing a great number of pieces the high carbon steel gives much the best results if carefully handled.

Dies should not be hardened in *cold* baths, lukewarm brine being the ideal means of quenching. The die should be lowered into the bath endwise or edgewise as the case may be and gently swung back and forth, as shown in Fig. 6, to force the liquid through the opening, as it is the walls of the opening and the face of the die immediately around the opening that requires hardening. Extreme care must be exercised when heating for hardening for there is hardly any other class of work where slightly uneven heats prove so disastrous. They must not be heated too rapidly, or the corners and projections will be overheated before the balance of the piece is

hot enough. Any screw or dowel pin holes should be plugged with fire clay or asbestos clay mixed with water. This clay should be allowed to dry before heating in the fire. Unless the temper of the die is to be drawn immediately it



METHOD OF PLOWING RICE FIELDS IN THE PHILLIPINE ISLANDS. NO CHANCE HERE FOR EITHER THE SHOER OR THE PLOW REPAIRMAN.

is removed from the bath, the "strains should be removed" by heating over the fire. This is *especially* true of large dies.

Dies of high carbon steel and those having intricate projections should be cooled in brine until, they cease "singing" when they should be immediately plunged in oil and left until cold. It requires the services of a skillful hardener to remove a die from the bath while the interior is hot and draw the temper without cracking it, as the heated interior would cause the unyielding exterior to expand so rapidly it would crack before the exterior portion became heated sufficiently by outward application of heat so it could yield to the internal expansion.

Articles such as the hollow mills of the description shown in Fig. 7, should be hardened with the opening uppermost as shown in order that the steam may readily escape, and the liquid get to the walls of the hole, as these must be hard. Grooved rolls give a vast amount of trouble when hardened. This, however, may be overcome by using a bath having discharge pipes up the side. Pieces that are so designed that uniform contraction would be impossible while they were cooling in the bath, may be "doctored" at times by binding a piece of sheet iron to the light portion. Take for instance the article shown in Fig. 8, this being heavy on one side and extremely light on the opposite, and as a consequence, would chill very quickly. To prevent this a piece of sheet steel may be bound on outside and another on the inside as shown in Fig. 9, or, if it were not necessary to harden the walls of the hole, the sheet steel piece might be attached to the outside as shown and the hole

filled with fire clay. The piece should be heated uniformly and dipped slowly in the bath with the hole *uppermost*. If the hole were filled with fire clay, a wire could be cemented in with the clay and the piece held by this when immersed in

the bath. If the hole was not to be filled as described, then a bent wire,  $\frac{3}{4}$  of an inch smaller than the hole should be placed in the hole and heated with the piece, then the piece when dipped in the bath would cool nearly uniformly with the balance of the piece. It would be advisable, however, to place the sheet metal on outside as shown in Fig. 9.



A MODERN MOWER AS USED IN RUSSIA, WITH ITS QUIANT TEAM OF CAMELS.

The object to be obtained by these various methods is to prevent the too sudden cooling of the thin wall of stock, which is then rigid, and brittle, while the balance of the piece is cooling and pulling out of shape, thus breaking it.

In view of the fact that every smith is at times called upon to harden and temper springs, it would seem unwise to call this article complete without considering that subject. It is not necessarily desirable to harden a spring, but it is generally necessary in order to produce

the desired degree of stiffness. Unfortunately, hardening steel always causes brittleness also, and to reduce the brittleness we reheat the piece as in tempering until the brittleness is reduced to a point that allows us to bend the piece without breaking it. The temper must not be drawn to a point that reduces the stiffness so it will not return to its original shape. As brittleness is to be avoided so far as possible, the article should be dipped when hardened in a slow cooling bath, provided sufficient stiffness is produced. Generally speaking, cold water is a very unsatisfactory medium for use when hardening springs. If the articles are comparatively light, a bath of sperm or lard oil answers nicely. If oil does not work satisfactorily, it is advisable at times to add a little alum or a small amount of beeswax, at times a little resin added to the oil works nicely. The quantities of these ingredients must be varied to meet the requirements. When a bath of oil cannot be made to answer even by the addition of any of the ingredients mentioned, it is necessary to use a bath of warm, or even hot water. I have seen car springs made from Bessemer steel which would not harden in any form of oil bath, give excellent results when dipped in water which was

nearly boiling hot. To be sure the steel did not show any great degree of hardness when tested with a file, but it was extremely stiff and when tempered made an excellent spring.

There are several methods in common use among smiths to determine when the temper has been reduced sufficiently. The more common method is to cover the hardened steel with oil or tallow, then hold over the fire until the oil catches fire and burns from the heat in the steel. This is called "flashing off," very light

pieces are "flashed" once, heavy pieces twice, three, or even more times according to the experience of the smith. Another method consists in reheating over the fire until a little sawdust or a thin shaving procured by drawing a hammer handle or other hardwood stick across the corner of the spring catches fire from the heat in the spring. An-

of three bones, the coffin bone at A, the navicular bone at B and the coronary bone at C. If the foot does not set level there will be a great strain on this joint, and this will cause an irritation and inflammation will set in. This will also throw a strain on the coronary joint. The small cannon bone D, connected to the long cannon bone E forms the

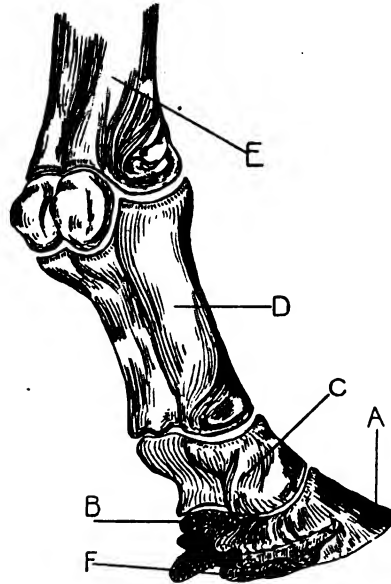
tance of about three inches from one end. Now rough out, as shown at A, with fullers, keeping as close to the eye as possible so as not to get the necked parts too long. Now make a long taper pin and after slightly flattening, drive it slowly into the eye of the hammer. Then forge out the circular or center part of hammer and gradually round up

The suspensory ligament of the fetlock is located back of the long cannon bone.

The lateral sesamoid ligaments are joined to the sesamoid bones running from behind, around and to the front.

The superficial sesamoid ligaments join the sesamoid bones with the coronary bones.

The perforans tendon extends upward from the under side of the coffin bone.



SKELETON OF THE SOUND FOOT.

The long cannon bone.

The only ligament on the front of the foot is the extensor tendon which runs up from the top of the coffin bone.

The short cannon bone, also known as the os suffraginis.

The coronary bone.

The navicular bone.

The coffin bone, in the hollow of which rests the plantar cushion and fleshy frog.

other, but not a common method at the present time, consists in brightening the spring and drawing to a second blue. To accomplish this the hardened spring is heated until the various temper colors show in order, the last, of course, being a blue. We now continue heating until they disappear and then start again and when a full blue color is visible, the spring may be plunged in warm oil, *not cold water*.

If the springs are made in large batches the above methods prove costly and it is advisable to draw temper by heating in a kettle of oil, gauging the heat by a thermometer. The exact temperature cannot be stated arbitrarily as much depends on the grade of steel used, the shape and thickness of the spring, the temperature of the hardening heat and the requirements of the spring. However, the temperature varies from 560° to 630° F.

(To be continued.)

#### A Few Notes on the Horse's Foot.

C. W. METCALF.

If you notice how the bones of a horse's foot are put together, you will see that if the foot is not level and the shoe is also set unlevel, there is a great strain on the joint and also on the tendons which connect the joints. For instance, we will take the coffin joint which consists

ankle joint. You will notice that as soon as any fever is present in the foot, the frog and sole of the foot becomes dry and hard and the heels will begin to curl in. You will never find a foot contracted that is in good normal condition, and in nailing shoes we should carefully notice the thickness and shape of the wall of the foot before we drive the nails. The hoof will vary from  $\frac{1}{4}$  to  $\frac{1}{2}$ -inch in thickness, and while some can drive a large nail without injuring the hoof, others will have to use a small nail. Some feet will stand high nailing and others will not. These things all require practice, but the first thing we should learn to do is to dress the feet so as to have an equal strain on all the joints and tendons. Then we will accomplish something. Of course, this will take lots of study, for you will seldom find two feet alike. It takes an active brain to do all of this work as it should be done and mix a little practice in with it. And just when you think you have it all, you are just commencing to learn the cause and the reason for the cause.

#### Making a Ball Pene Hammer.

W. H. N.

To make a ball pene hammer take either square or octagonal stock, I prefer the octagonal stock and punch a round  $\frac{1}{2}$ -inch hole through it at a dis-

the necked parts. The ball is next shaped to as near the finished size and shape as possible. The large end of the hammer is now shaped up and the entire shaped piece cut from the bar. The face is now forged true and the entire piece ground true and tempered. The ball pene hammer is also forged with octagonal neck parts, but I prefer these round in section. The engraving at B and C, show a side and also an end view of the finished hammer.

#### Purchasing a Gasoline Engine.

F. GILBERT.

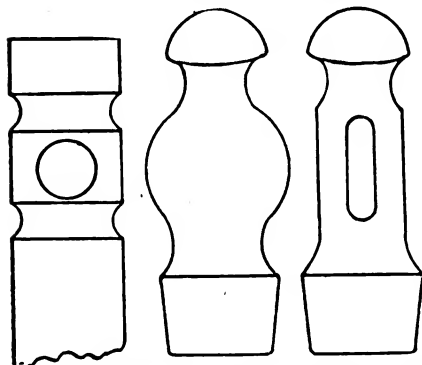
When buying a gas engine one may take any one of the hundred or more makes without going far astray. It might however be of use to the buyer to know some of those features which might easily be overlooked, but which might make a decided difference in the durability and effectiveness of the machine and in the pleasure of operating it. Practically all of the smaller powers (small powers, up to 25 H. P., are the only ones generally considered economical with gasoline) are made with a view to simplicity, with a single cylinder—technically, four cycle—giving one impulse for every two revolutions of the fly wheels when running under a full load, and less frequent impulses when under a lighter

load. Hence the heavy balance or fly wheels, in order to give a steady motion. Within limits, which are not likely to be exceeded as long as iron costs money and competition is sharp, the heavier the fly wheels the better; the only apparent objection to excessive weight in them being the increased friction on the bearings and the strain on the crank shaft. The strain upon it is not less than four times that on the crank of a steam engine of the same power.

#### A Unique Letter-Head Design.

The accompanying engraving shows a very pleasing design originated by Mr. George F. Daly a St. Louis horse shoer. Mr. Daly uses this design on his letter and bill heads and it is almost needless to say that a smith with such originality is also an advertiser. It occurs to us that Mr. Daly might make good use in his advertising of some such phrase as "The man in the horseshoe." This used in connection with the cut and his name would tend to make the public connect the name Geo. F. Daly, with the cut.

Every smith will do well to break away from the conventional form of letter and bill head and use some such combination as here illustrated. We cannot believe that the craftsman continually called upon to perform some



A GOOD HAMMER IS WELL WORTH THE MAKING.

out-of-the-ordinary job cannot study out something original in the way of a neat photographic combination or sketch for use on his printed matter, and we should be very glad to hear from others of our readers who use some such engraving as here illustrated.

#### A Shop Equipped for General Repair Work.

C. W. METCALF.

The accompanying engraving shows the plan of a shop equipped for general repair work. All machines are most advantageously situated and each one is given sufficient space to permit easy operation. The size of the building is 30 by 50 feet. A, represents a vise and

bench; B, the coal box; C, the forge; D, anvil; E, tank; F, power hammer; G, emery stand; H, disc sharpener; J, drill



AN ORIGINAL DESIGN ADDS MUCH TO THE EFFECTIVENESS OF A LETTERHEAD.

K, desk; L, planer; M, band saw; N, bolt rack; O, spoke rack; P, grind stone; Q, tool case; R, work bench; T, wood stock; U, Fairbanks, Morse 4 H. P. engine; V, circle saw; W, shoeing floor.

#### The Correct and Incorrect Method of Shoeing.

M. E. WING.

A horse without good feet is nearly useless, therefore the feet of the horse should be looked after with the greatest of care. To keep the feet in good condition, we must see what nature has done for the horse. In his natural state the horse does not need shoes, nature gave him a tough hoof composed of the shell, the sole and the frog.

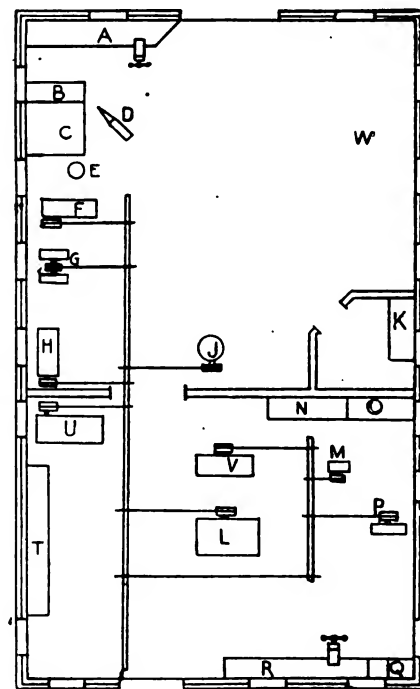
The secret of good shoeing is to keep in mind how the wear comes on the feet when the horse is in his natural state. You will see that the sole of the foot is of softer material than the shell and wears away faster which leaves most of the weight and wear to come on the shell and frog. When the shell wears down, the sole gets thin, the foot gets sore and the horse becomes lame and has to be shod. The owner now takes the animal to the shop to be shod. The blacksmith, (not all, but 75 of them) will take a rasp and level the foot up a little and in doing this, he rasps away the shell which is already worn too much and nails the shoe right on the sole which is now sore from the pressure on the ground.

Now the trouble begins. The horse's feet are sore and the shoe is nailed right on the sore spot and keeps irritating it. In a few days the shell grows slightly and the horse travels a little better. He gets along pretty well now for a while,

until the shoes either wear out or come off. If the animal goes four or five months before this happens, the owner says the blacksmith is a good one and takes the horse back to him to shoe again.

This time the shell and sole have grown out long, so he rasps off the shell and sole, the shell being the harder it cuts away faster than the sole, so the shoe is again nailed on with most of the weight on the tenderest part of the foot. This treatment causes fever, and fever dries out the foot and causes contraction. The horse now becomes lame, the owner takes him to the blacksmith and the smith takes off the shoe, digs around in the foot and finally discovers a red spot in the inside corner or heel. He says it is a corn. He cuts this out, digs a hole up in the sole as far as he dares, puts the shoe on again, leaving the heel a little loose so as to take the bearing off the corn. This is the first thing he has done to relieve the horse.

The horse goes a little better this time and the owner says the blacksmith is a "cracker-jack." By the time the horse needs shoeing again he is as lame as ever. This is a natural consequence as the hole where the corn was dug out has let the shell draw together and causes the corn to be larger. The corn is dug out



INTELLIGENTLY PLACED MACHINES ENABLE A SMITH TO DO HIS WORK QUICKLY.

again and the shoe nailed on again as before, and the horse goes better again. This treatment is kept up right along, the horse gradually grows worse, is finally useless and is traded off to be pounded around by jockies, or is sometimes sent

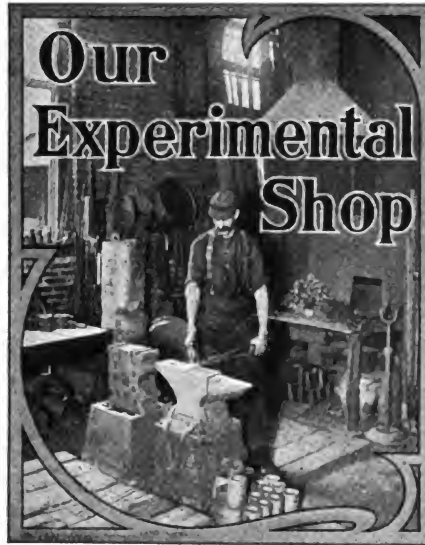


out to pasture to rest up. You will agree with me that this is the course of the horse as shod by 75 of the blacksmiths. But, you ask, how is this to be remedied? The horse must be shod so we can use him. I have told you how 75 of the blacksmiths shoe the horse, now I will tell you how the other tenth shoes him.

As I said before the shoer should keep in mind what nature does. The horse comes to the shop to be shod for the first time. His feet are worn down as before stated, but this blacksmith is very careful not to let the shoe rest on the sole of the foot. The shoe is made big enough to fit the foot, so there is nothing to be cut off, and you will find that the horse goes away from the shop as free as if he had never been lame. When the horse comes back to be shod again, the blacksmith takes care to dress the foot down in good shape, leaving the shell a little longer than the sole and dressing the sole out so as not to let the shoe rest on it. The shoe is made level and not beveled in like a dish which crowds the foot together every time the horse puts his weight on it, but is leveled so as to give the same bearing as he had when he was barefooted. A horse shod in this way with any reasonable care of the feet by the owner, will never have any corns.

This is the way to shoe a horse with good healthy feet, but when shoeing horses you come across bad feet as well as good ones, and I dare say you will find the bad ones more plentiful than the good ones. So we must study what to do with the bad feet to relieve them. I will take up the contracted feet first. You will find the contracted feet hard, dry and grown together. They should be dressed down well. This is a hard job which most blacksmiths dislike to do, and so neglect this important part. If there are corns in the feet, do not cut them out by digging a hole in the foot, but dress them down nicely with the rest of the foot, bevel in the shell so the outside is longer than the inside and dressing the heel down so the shoe will not rest too heavily on it. Remember that the red spot you see in the bottom of the foot is not sore at the bottom where you see it, for there are no nerves in the sole, but the trouble is where this blood starts from. The shell has drawn together and squeezed the arteries so the blood could not flow through them freely, so they have become ruptured and the blood works out through the sole where you see the red spot which is called a corn. Now in putting a shoe on this foot, you must keep this in mind, and bevel the shoe so as to spread the foot when the

weight comes onto it. Great care should be taken to get the foot and the shoe beveled the same, and not to let the shoe rest on the sole.

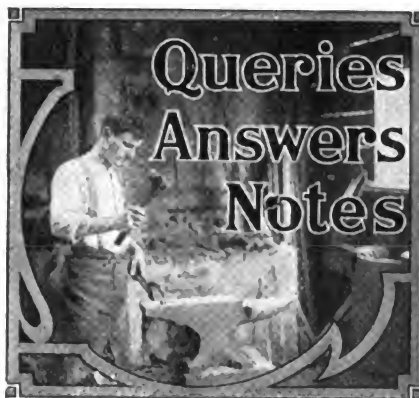


Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

When a job requiring the drilling of a piece of hardened steel, comes in, try a well-tempered flat drill and use camphor and turpentine as a lubricant.

A piece of unslacked lime placed in the case where the polished shoes and exhibition tools are kept will prevent their rusting. Of course the lime should be renewed at intervals.

When a wood screw works loose try this little kink: take the screw out and plug the hole with cork. Then replace the screw as previously.



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**A Question for the Art Worker.**—Will Mr. Thomas Googerty kindly show me how the acanthus leaf is forged or molded to cover a scroll? I. H.

**To shoe a Forger.**—I don't understand how to shoe a horse that forges. Will some brother of the craft give me his best information on this subject, in the next issue? G. C. PORTERFIELD.

**About Horse Racks.**—I noticed that some brother asked if anyone had used the Barcus racks. I have, and can recommend them to anyone as being all right in every respect. W. A. SHORT

**Galvanized Iron or Tin Roofing.**—Will some brother blacksmith tell me if galvanized iron roofing will last long on a blacksmith shop? I have been informed that tin will last but a short time. G. N. S.

**To Temper Cold Chisels.**—Will you kindly tell me how to temper a cold chisel made of Sanderson or Park Brothers cast steel? I sharpen a great many other tools with good results but require more information on cold chisels. J. HARDENBERGH.

**To Pass an Examination.**—I would like to know what questions a horse-shoer should be able to answer in order to pass an examination for shoer. What are the qualifications necessary to be a competent horseshoer? T. J. STEPHENS

**That Question of Welding Steel.**—Use Cherry Heat Welding compound. Put it on your scarfed pieces, on both sides, while it is hot, so you get it covered well. Let it cool a little, heat the split pieces and unite. Put in fire and weld. Use Boraxette to protect from burning or overheating. It is far better than borax or sand. EDWARD LORASN.

**Case-hardening Calks.**—In answer to Brother Craig's query; my plan is to put a plow share or piece of plow metal in the fire, and heat calk to cherry heat. Then when plow metal begins to melt, rub it over the calk. It will rub off like grease. A thin coat is better than a thick one and makes a neater job. JOHN O'NEIL.

**Trouble with leaky Cylinder.**—Would like someone, who has had trouble with a leaky cylinder, to give me some "light." I have no compression and smoke comes out at the back end. I ordered new cylinder rings and put them in but could tell no difference. My machine went wrong all at once. Will some brother please tell me what to do. A. E. THORNTON.

**The Cold Setter Question.**—A brother smith asks in your paper which is the best cold tire setter. I have seen several at work, but the Brooks is the best I have ever seen. I have shrunk both iron and steel tires with my machine and then cut and welded them just to see how it worked. It is just as good after shrinking as before or better. I would advise the brother to buy a Brooks cold tire setter. CASSEY BROTHERS.

**For Removing Broken Spoke Tenons.**—This is a tool that perhaps some of the craftsmen do not know about. It is for pulling broken spoke tenons out of a wagon hub. Take a 1/2-inch lag screw and weld a 24 inch piece of 3/4-inch rod to it. Now bend a T on the end of the rod for a handle. The tool is now ready for use. To remove a broken tenon bore a 3/4-inch hole in it, screw the tool in and drive the tenon out by striking the T with the hammer. BROWN WILSON.

**Couldn't do Without Power.**—I have put power in my shop the past year and do not know how I got along without it. I have a 6-horse power engine that runs a band saw, an emery wheel, a drill and a thread cutter and I don't know how I could get along without power now. I carry a side-line of all kinds of farm

implements, buggies and wagons. I carry Weber wagons, Sanders disc plows and farm implements. O. SEARCY.

**Bubbles in Varnish.**—I would like to ask a question through your paper. I have been having some trouble with the finishing varnish on carriages. I have painted carriages for several years, but I can't tell why this occurs. I have two jobs now that I have finished with Murphy's Body Varnish, \$4.00 per gallon. The defect is that the job is full of bubbles. It is not dust or dirt, as I am careful about that, and I have examined the surface and find that they are bubbles. Could some painter tell me the reason for the formation of the bubbles? G. W. SAGER.

**Hardening Toe Calks.**—In the March issue of your valuable paper, Clyde Craig asks how toe calks can be hardened with metal. I don't know, but I do know how it can be done with a chemical, yellow prussiate potash. This must be in a glossy lump, not air slacked. Keep it air-tight in a fruit jar, or something of that nature. When you wish to harden a toe calk, have the shoe ready to go on the hoof. Then heat it almost to a welding heat, take it out of the fire, and hold it on the potash until it fries. Return it to the fire again until almost a welding heat, then cool quickly in water. This will harden the calks. G. P. STOKER.

**To Temper Granite Tools.**—I saw in THE AMERICAN BLACKSMITH for April a request from some smith to tell how to temper granite tools. I have worked on these tools for a number of years and I think my way just as good as any. Draw the tool down thin after narrowing down first. Do not narrow after drawing thin. Then use only clear spring water as a bath, heating tool to a dark red. Plunge in bath and have an extra iron in the fire. Place tool on hot iron and draw temper to a very light straw. Rub tool from bath with a piece of sand stone, so to see color. By a little practice, you can become skillful. A. B. HANNAN

**Power in the Shop.**—I notice that some smiths are asking about power in the shop. I, for one, am very much in favor of power. It not only lightens the labor but it draws new customers your way and the grade of work can be made much better. There are lots of jobs, which a few minutes at the emery would make much nicer, and mark the smith as a fine workman. About six months ago, I sold a power shop and went west. I leased an outfit, and tried the shop without power, but I soon got enough of it, and am now at another place, working for a man who has power tools. W. A. SHORT.

**To Shoe an Overreacher.**—In answer to Mr. E. Lindblad's question will say: First, find the cause of the trouble. Is it a deformity, a lame joint or soreness in front? Of course, he doesn't pick up his front foot quick enough. If the cause is deformity, then shoe him with front heel as low as possible and his hind heel high. Also spread him behind as follows: Fit the front shoe without any calks and follow the outline wall closely ending the shoe where the wall ends. Fit the hind shoe with a medium calk inside and a wide calk outside. This

will spread him and being a high heel will also tend to check his long stroke with the hind foot. An A. B. READER.

On page 117 of the March issue, I think that Brother S. J. P. has unintentionally used the word weld in his article. He says: "After it is welded put the Ideal clamp on point of shear." I think he meant after it is fitted, as the clamp would be of no more use after welding. This is not my way of making. I commence welding at the point and come up. This I find is much better as the point is more easily fitted this way. For instance, when the last weld is made at the top, you can put the shear on the plow while hot and fit it perfectly by driving on the point of shear. I don't finish the point until I finish fitting after welding.

W. A. SHORT.

**Organization and Better Prices.**—We cannot expect to accomplish anything as long as we pull against our neighbor smiths. We will all have to pull together to do things. We need laws to protect the smith. A law requiring every horse-shoer to pass an examination before allowed to shoe a horse and another law making the horse subject to the debt for shoeing. It is hard enough to have to work at the prices that we now get but it is still worse to have to work for nothing and every smith who runs a credit business is sure to do some man's work absolutely free. That is if the people everywhere are like they are in the west end of the Bluegrass state. Why not organize and fight for our rights? Let us hear from you, reader. E. E. SMITH.

**On the use of Cold Setters.**—One brother smith has written an able piece on cold tire setting but I prefer the old way. It takes longer, it is true, but it is a better job when done properly. All the talk about dishing a wheel is bosh. Brother smith; Do your work properly, and you won't dish a wheel. As to the amount of draw, it depends largely upon the condition of the wheel. When you get your tire shrunk, screw your wheel down on the wheeljack so that it shows about  $\frac{1}{4}$ -inch less dish than it ought to have. If it is a farm wagon wheel, old style, you can take the dish out of it by doing the work properly. Light wheels are more difficult, as the width of a hair almost dishes a wheel. As in all work, you must be careful and not think so much of the amount of money earned as you do of good work. JACOB ZIMMERLI, SR.

**The Catalogue House.**—A question of everyday interest to the smith is, how are we going to buy goods cheap enough to compete with the catalogue houses? Every farmer in the country has a catalogue, compares prices and wants our goods for the same prices as those quoted in the catalogue. Now there is a way we can overcome this difficulty and that is to have our own factories and manufacture the things we use in our line. In this way we could buy direct and save jobber's profits. The mail order houses buy in large quantities and some manufacture their goods. What are we to do when a man wanting a new set of wheels and is told that they will cost him \$10, says he can buy them for \$7.50? I would like to hear from some other

brother on this subject. If we can overcome this, I for one am ready to help. What say you, brothers? B. F. TALLEY.

**Some Prices from Maine.**—I send in these prices in the hope that they may help other smiths to get more for their work, as I know that prices in some localities are much lower.

Four new shoes—according to size—

.....	\$1.00 to	\$1.25
Resetting .....		.60
Light tires, new.....		4.00
Resetting tires.....		2.00
New axles, per set.....		5.00
Whiffle trees, per set of 2.....		2.50
Single trees.....		1.50
Light Poles .....		1.50
Spokes ... ..	.20 to	.25
Light shafts per pair.....		2.50
Cross bars .....		.50
Painting carriages from ....	7.00 to	12.00

My shop is 24 by 40 feet and when I am able to work I have more than I can do. F. W. EDWARDS.

**In Reply to his Criticsers.**—It fills my heart with pride at the thought of being remembered by a dear old veteran, "Shake" Brother Woodward, well I should say I did. I have shaken several times with laughter at your witty criticism on Page 98 of the February number. But, you certainly can't expect, brother, that we youngsters of today will follow in the rut of 60 years ago.

See description and specifications of my \$12.00 hammer on page 6 of the October 1904 number of this worthy Journal. I shall be delighted to furnish special information to any one wishing to build a hammer. I extend a hearty invitation to call on me to my brother smith, who on page 99 of the February number says: He is also from the Sunflower State. Bring up half a dozen lays and let me point them for you, and I will convince you that I am right here with the goods.

WALTER MCCOY, Conway, Kan.

**How to Make an Emery-stand.**—In the March issue, P. J. E. asks how to make an emery stand. Take an inch and a half shaft 2 feet long. Weld or braze a  $\frac{3}{4}$ -inch washer 3-inches from each end. Put in lathe and true up. Turn the shaft, from washers on each end, down to one inch. Cut a right hand thread on one end for  $\frac{1}{4}$ -inches and a left on the other end for same length. Now fit a loose washer on each end same size as the one on the shaft. Take any boxing that you have, say  $3\frac{1}{2}$  or 4-inch bearing and babbitt up to fit shaft. Now take a piece of 2 by 8-inch oak or hickory, dress up nicely and bore a  $\frac{1}{4}$ -inch hole in center. Then fit your boxing on each end, so that the bearing will fit between collars on the shaft. Take an old pump stand, cut the top level and smooth and fit a 2 by 12 by 12 oak piece for the bottom of the stand. Now bore a  $\frac{1}{4}$  hole in the center, run a  $\frac{1}{4}$ -inch rod through this hole up through the pump stand and through the hole in the top piece. Screw the nut down tight and you have a nice light emery stand that will run two 2 by 10-inch wheels at a speed of 2,000 revolutions. If you use a solid pulley on the axle, fit it on before you weld on the washers or collars. A pulley about 4-inches in diameter will be large enough.

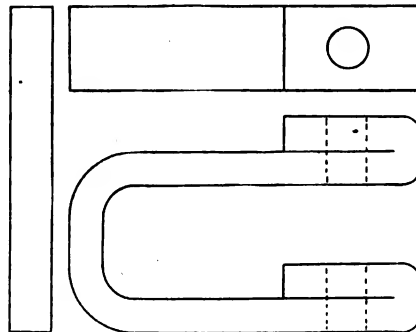
In the March paper is an inquiry by E. Lindblad as to shoeing a horse that forges, and as the answer to it is so entirely different to any theory I ever worked out, I will make the following reply. To stop a horse from forging, you must first remove the cause. The cause of a horse's forging is that the action of his hind feet is quicker than that of his front feet, and to stop him you must reverse that action. To do this, you must work on both the front and hind feet at the same time. To increase the action of the front feet: If you want calks on the shoes, set the toe calk well back on the shoe, level the shoe and then fit it to the foot. Do not shorten the shoe in the least. This will give your horse a rolling motion when he goes to pick up and he will raise his foot quicker in getting it out of the way of his hind feet. To decrease the action of his hind feet: Fit the shoe level and place the toe calk out to the edge of the shoe. Do not in any case set the shoe back on the foot, from the toe. If the foot has been worn or filed back at the toe, let your shoe stick out ahead, it will do no harm. If you set the shoe back from the toe and round the hoof, you simply stop the noise, and not the forging, and at the same time, you are increasing the action of his hind feet instead of decreasing it. D.

**Several Good Pointers.**—I have been working at my trade, gun blacksmithing and wagon work, for 20 years, and have not worked a day as an apprentice. If a man has judgment and mechanical ability, his power is unlimited. I was raised on a farm and have had experience with almost every kind of machinery, which I find is my greatest help in making repairs. I see one smith says that if he cannot do work his way he is off the job. If by reasonable explanation the customer doesn't see my way is the best, I do the work his way. He pays for the job and should have consideration. For the benefit of Wm. J. Rust and J. J. as to brazing: I have lots of this to do in gun and bicycle work and some kinds of machinery. First clean all rust and grease off with file or scraper and bind parts with wire or clamps. Place borax on the joint and fuse till like molasses. Then place spelter or brass on the joint and melt till it flows in the joint. Remove from fire, let cool until it shows no red and pour water on till cold so the flux will be easily removed. Practice makes perfect. Don't heat too fast and have clean fire. My side line is fertilizers, guns, bicycles and ammunition. J. A. TIREY.

**From a Young Kansas Smith**—I have been here over 2 years and did not know one man before I came. I had only \$10.00 when I stopped and had freight bills to pay on my household goods. I rented the shop at \$3.00 per month, tools and shop complete, and went to work. I had only one man in opposition. He had never learned the trade, just went to work and tried to get all he could as cheap as he could, but could not even weld a spring of any kind. He would go out into the road and tell people that I charged just twice as much as he, and my work was but little better than his. He never said that he could beat me, but that his work did not look fancy, but stood just the

same. Well, he has been gone about 9 months. I have bought the house and shop where he lived and worked, and have a 3½-Horse Columbus Engine, A Boyton and Plummer power drill, a Kinnard emery stand, five iron shares, a Royal blower, a Bull Dog Woodworkers' Vise, 26-foot line shaft, and other tools of a smaller size. I have made a good payment on my lot and home, and paid for all my tools, and kept my accounts all pretty well paid up. I am 28 years old, born, raised and learned my trade in Missouri. Have nothing on hand that I can't do, and have what you call a good all around knowledge of my trade, yet I have lots of good points to learn yet. If I was through learning, I would not read THE AMERICAN BLACKSMITH. I am proud of my trade. C. R. ELLIS.

**A Home-made Punch.**—The accompanying engraving shows a home-made punch such as I made for use in my shop. It can be made at little or no cost, as most any scrap pile will furnish the material. The punch is made of a piece of  $\frac{1}{4}$  by  $1\frac{1}{4}$ -inch spring plate and punches a clean hole in either hot or cold stock. Procure



A SIMPLE HOME-MADE PUNCH.

a piece of an old spring plate about 16 inches long. Bend it as shown in the engraving and then drill a  $\frac{1}{4}$ -inch hole as shown, to receive the pins for punching. The pins for punching can be made in several sizes from good stock and carefully hardened. S. R.

**A Simple Axle Gauge**—I saw a request from Brother D. D. Elliott in regard to an axle gauge. I know there is nothing better in the market than the one I use, and if any brother writes to me I will give him further instructions if he is not successful in following these.

Take at half the height of the front wheel, the length of the arm to be set and measure the dish of the wheel. Now take two steel squares and place them together. Then run up the one square to the height of the front wheel, and there place the top square, the dish of the wheel. Then go up the square to the length of the arm, and find out the distance the top square is from the edge of the bottom square. Take half the tops of the axle and throw the balance under, and you will have your wheels to run on plumb spoke. You can take any old stick and make the gauge as long as you have the thumb screws in proper place.

A. B. HANNAN, Woodstock Ontario.

**The Traveler or Compass.**—In regard to the use of the traveler or the compass,

I use both. I never trust to guess work about the size of the wheel. I travel the wheel and carefully mark it on the traveller. Then I go round it again to see if I have made a mistake, and if it does not come out the same, I go over it a third time to see which is right. I then measure the tire the same way, and see how much to take out of the tire. Then comes the time to use the compass. I take a sharp center punch and punch the tire a few inches from where I want to shrink it. I then use a compass set about 12 or 14 inches open and step from the first puncture beyond where I want to shrink it at, and then punch exactly where the other point comes. I then heat a place in the tire about 4 inches long, to a yellow heat and then put it in the shrinker (I use a Stoddard number 2) and shrink it up a little more than I want it. That gives me room to hammer it smooth and straight again, and by using the compass, I can tell just how much I want to hammer it, in half the time I could lay it down and run the traveler round it. I always give  $\frac{1}{4}$  of an inch solid draw for cart wheels, but on log wheels 6 feet high  $\frac{1}{4}$  of an inch is not too much. On buggy wheels I only give  $\frac{1}{8}$  and I never have any trouble with too much dish except in old wheels that have had the tires shrunk on them too tight before. A. J. PANTON.

**Repairing Sarven Wheels.**—There has been a good deal of controversy in regard to cutting the rivets in Sarven wheels but I think the advocates for cutting the rivets have got the best of the argument at present, anyway I always cut them and put in new ones. I have taken wheels to pieces that had been repaired before, and found that the workman had cut the rivets out and instead of putting in new ones, he had hammered the old ones smaller in the middle to make them long enough to head again. A rivet like that is good only to hold the flanges together. It is no support for the spoke as the hole is bored  $\frac{1}{4}$  of an inch to let the end of the rivet go through and the rivet is only  $\frac{1}{4}$  of an inch square. The spoke soon gets loose just the same as if there was no rivet there at all. Some argue that you cannot get the flanges riveted up as tight again as they were when the wheel was new. That may be, but I certainly can draw the flanges down on the spokes tighter by brading the rivets on the anvil, than I can by driving the spoke between the flanges. Because every workman knows that to drive a piece of wood tightly between two pieces of iron destroys the structure of the wood. If anybody wants to know what I mean let him drive a piece of wood in the hole of the anvil and take it out and look at it. And also if I attempt to drive the spokes in without taking out the rivets the best fitting I can do will leave a space between spokes, and by taking the rivets out and putting in the spokes to fit, I make them fit perfectly. Reasonable, isn't it? A. J. PANTON.

**Curing a Sand-crack.**—In answering a query regarding the advisability of working a horse with a sand-crack, Mr. H. Hutcheon, C. V. S. in the agricultural journal says: "It is not advisable to work a horse with a sandcrack which ex

tends right up into the coronet. It is very painful and it prevents it closing. It is essential to successful treatment that the sides of the crack be levelled down at the top, otherwise it will continue to grow down a crack. The first thing, however, is to make a complete separation between the bottom portion of the crack and the apex of the triangle. The horn must be cut right through at the apex so that when the foot comes down on the ground and the edges of the crack separate, that separation cannot extend above the apex of the triangle. The operation is best carried out first with a fine drawing knife, then the part is bottomed by a thin edged iron made red hot.

Do not injure the vascular laminae under the horn, but see that the iron gets through the horn thus completely separating the top portion from the bottom. Then level down the horn as far as possible, but if you cannot complete this at once, get the crack out of the coronet; put some tar on the part or put the foot in a poultice, and after a few days pare the edges down again with a sharp knife. Repeat this until the crack is completely cut out and then rub a little blister onto the coronet to stimulate the growth of horn. The crack will gradually grow out. Keep the coronet greased after, to assist in the growth of healthy horn. READER.

**A Letter and some Prices from Oregon.**—It is amusing to read the prices quoted for work, by our Eastern brother smiths. C. L. Higginbotham asks how are we going to make a living out of the business if labor and material continue to get higher. I suggest that the smiths get together and raise the prices, or another plan would be to do as I have done, come west where good prices exist. I will give a few of the prices we get.

Setting wagon or buggy tires	.....	\$3.00
Spokes, according to size	.....	.35 to .50
Felloes	.....	.35 to .50
Wide felloes, each	.....	.75 to 1.25
New bolster	.....	3.50 to 4.00
Rear hound, each	.....	1.50 to 2.00
Sway hound, each	.....	2.50
Tongue hound, each	.....	1.50 to 2.00
New tongue, each	.....	4.50 to 7.50
Axles	.....	5.00 to 8.00
4 shoes	.....	2.00
Plates or calked hand turned shoes, each	.....	1.00
Plow sharpening	.....	.35 to .50
New lays, according to size	.....	3.50 to 6.00

W. J. Hill wants to know how to color a gun without heat. If he will apply sulphuric acid it will give the desired effect. One of the craft wants to know how to temper a gun spring. I will give my method which is good. Forge and sharpen the spring, heat to a cherry red and drop into oil of almost any kind. When cool, take a piece of sheet iron and lay over the fire, lay the spring on and allow the oil to burn off until the color turns gray. Then lay to one side to cool. If the gray doesn't show with what oil is on the spring, dip your tongs into the oil and throw more on until the right gray shows. I have never had one break when tempered in this way. W. M. GRAHAM.

**A Well equipped Power Shop**—I have been in the shop business since 1867,

thirty-nine years. I have my present shop fairly well equipped. My shop is 22 by 90 feet, divided into three parts. First, blacksmith, second, woodwork and third, paint shop. We also have another room 22 by 50 by the side of the main shop, in which we have most of our machinery. We have installed a 2-horse power gasoline engine (International) a 33i-nch band saw, a 7-inch planer and an emery stand with a 2 by 12-inch wheel on each end, one fine, and one coarse. We grind many things, such as discs, plows, plow points, road scraper blades and all kinds of tools. We also have another very fine emery wheel double-faced on which we grind mowing machine blades, and another double emery stand for grinding cross cut and circular saws. We also have a boring machine, a wood turning lathe, and a 36-inch grindstone. Our countershaft is long and one end goes into the main shop and from it we run a number 2 Coe drill. We also have, in the main shop, a House cold tire shrinker. The more I use it the better I like it, and it is now in its third year. We also have a Stoddard hot shrinker to shrink up to 6 inches, a Reynold's tire bolting machine and a set of stocks and dies. We can assure you that power does pay in a shop. We have one Wester Chief blower and a 40 inch Standard bellows. The bellows is swung overhead and is out of the way. Our coal bin is between the two forges. We buy coal by the carload. We carry a side line of Osburn machinery binders, mowers, rakes, disc and rig tooth harrows and cultivators, and do a general line of farm work. We are also agents for Farmer's Favorite Grain Drill. One wood workman can do as much with the use of machinery as two or three can without power. J. H. CODE.

**The Credit Question and Price Cutting**—I would like to use a little space in reply to Mr. W. Smith's talk on the credit question and price cutting. I have been in business for 45 years in different parts of this country, and I know from experience that most of our trouble in price cutting is with the farmer. For instance, a man will come and ask you what you can do a certain job for. You look at your catalog and figure the actual cost of goods, freight, and a reasonable profit. He will pull out his catalogue and tell you he can buy the same for a good deal less. Inferior goods, of course, but the same goods his friends use, and have given him net prices on. Now, could one of these smiths, if they can be called such, make a simple horse nail, a rivet or nail such as we used to make for wagon or buggy work, or a saddle clip? Can they make any part of a buggy? They can't make a plow that will turn dirt. They point and make plows that will not plow, every day, and ten men on the end of the beam could not make these plows take the ground. Some of my customers tell me, "Why blacksmith so and so cannot make my plow run as easy and level as you do you are the best hand on a plow around here." Why don't they stay by me if I do so much better work than the others? The secret is, I want pay for my work but not more than is justifiable and right. We have smiths who put shoes on a horse so

he can't travel. But these smiths can get 20% more work than good smiths. Why? Because they do lots of work for half price.

And now, about our pay. I would be perfectly satisfied to take potatoes, meat or even wood. But some customers won't even give you that for your material, let alone your work. In regard to the merchant spoken of. Alas! Too often he is in the same boat. The cause of this is that people simply do not think. If they did they would do differently. They say "Oh! well, I only owe the smith, 10 cents, that isn't very much." But hold on, how many others are there who owe him 25 cents, 50 cents, \$1.00, \$3.00, \$10.00? Can you help kicking for money? A. S. PRIMER.

**Several Questions—A Tenoning Machine.**—I want someone to tell me which is the best make of gasoline engine. Some say one make and some say another. Will someone kindly tell me through the columns of the Journal? I live 10 miles from a railroad station and I get more plow work than I can handle. I have applied for a patent on a double plow stock and also a corn coverer. I can't make them just as my trade demands and I will have to install some machinery of different kinds to make them for my customers. So I wish to ask the craft for all the information they have about the best gasoline engine and what make or style of planer will be best in getting out beams and helves. The beams are 4 feet 2 inches by 2 inches thick and 4 feet deep. The helves are out of wood 2 by 3½ by 22 inches long. What make of band saw is the best? I want to put in a 6-horse power engine and a small planer, and a good band saw.

I wish to know if it is right to put a hot shoe on a horse's hoof or foot? I don't do it and will not allow a man who is working for me to do so. I always say never put a shoe that is hotter than a smith can hold in his hand, on any horse's hoof. Am I right or wrong? I work three hands beside myself. My side line is selling buggies. I just received the agency from a buggy house.

For the benefit of some of the craft, I will give a description of my tenoning machine. I took an old fashioned blacksmith tire-drill, they cost scarcely anything, made a wheel bench, as high as I wanted it and then got a piece of sheet iron. Where the hole came through the leaf of my bench, I put this piece of sheet iron so that the wheel hubs would not cut my leaf. Then I cut a slot 10 inches long in the leaf and sheet iron, so that I could make it adjustable for both low and high wheels. I then fastened the drill on the other end of my leaf and instead of having the chuck round for round shank drill, I had a square chuck, so as to take my tenon auger or hollow auger shank. To get the wheel high enough I raise them with a piece of plank with a hole bored in it which goes under the wheel. If too high, I take off a piece and by that means I have a nice tenon outfit, as cheap as dirt and I would not swap it for one that sells for \$25.00 I hope some of the craft will try it and save themselves a lot of hard pushing. G. V. BLANCHARD.





DRILL

CHUCKS



A TRIAL IS MORE CONVINCING  
THAN ARGUMENT.

Why not  
try them?

THEIR GOOD POINTS:

Face plate strengthens body.  
Hole only large enough for right  
capacity.  
Screw and jaw extra large.  
Accurately made.  
Symmetrical design.

THE STANDARD TOOL CO. CLEVELAND.  
NEW YORK.

## Vulcan Horse Nails.



**V**stands for **VULCAN**;  
Powerful and Strong,  
If you use . . . . .

**VULCAN**  
Horse Nails

You Can Never Go Wrong.

THE QUALITY OF VULCAN HORSE  
NAILS IS FULLY GUARANTEED.

**The Fowler Nail Co.**  
SEYMOUR, CONN.  
SOLE MANUFACTURERS.

## WING RUBBER CARRIAGE TIRES

are made from tough, durable, lively New RUBBER. Quality is the first consideration. Our "Wing" Tire will outwear several ordinary rubber tires. The wings (see cut) keep water, sand and grit from working between the channel and the tire, to wear out the tire from underneath. Write for particulars.



The Goodyear Tire & Rubber Co.,

Carriage Tire Department,

AKRON, OHIO.

Boston, New York, Buffalo, Chicago, Cincinnati, Detroit,  
St. Louis, Denver, Los Angeles.



# SUPERIOR Horse Rasps

## The Best Yet

Best High-grade Steel.  
Hard, Thorough Temper. Sharp Cutting Edge.  
Sharp, Strong Teeth, Well Backed.

## Every Rasp Perfect

and Warranted

Made in all regular sizes, and in the new 18 inch Slim,  
which gives the user the advantage of a long stroke,  
— and at the same time a rasp of medium weight. —

## ASK YOUR DEALER FOR THEM



**Prices Current—Blacksmith Supplies.**

The following quotations are from dealers' stock, Buffalo, N. Y., June 1, 1906, and are subject to change. No variations have taken place since last month's quotations.

All prices, except on the bolts, are per hundred pounds. On bars and flats prices are in bundle lots.

**Bars—Common Iron and Soft Steel.**

$\frac{1}{2}$ in., round or square, Iron, \$2.80; Steel, \$2.80
$\frac{3}{4}$ in., " " " 2.40 " 2.40
$\frac{1}{2}$ in., " " " 2.20 " 2.20

**Flats—Bar and Band.**

$\frac{1}{2}$ x 1 in., Iron, \$2.40; Steel, \$2.40
$\frac{1}{2}$ x $1\frac{1}{2}$ in., " 2.30; " 2.80
8-16 x $1\frac{1}{2}$ in., " 2.50; " 2.50

**Norway and Swedish Iron.**

$\frac{1}{2}$ in., round or square, \$4.90
$\frac{3}{4}$ in., " " 4.50
$\frac{1}{2}$ in., " " 4.80
$\frac{1}{2}$ x 1 in., " 4.80
$\frac{1}{2}$ x $1\frac{1}{2}$ in., " 4.20

**Horseshoe Iron.**

For No. 1 shoe, $\frac{3}{8}$ x $\frac{1}{2}$ in., \$2.50
For No. 2 shoe, $\frac{3}{8}$ x $\frac{1}{2}$ in., 2.50
For No. 3 shoe, $\frac{3}{8}$ x $\frac{1}{2}$ in., 2.50
For No. 4 shoe, $\frac{3}{8}$ x $\frac{1}{2}$ in., 2.50

**Toe Calk Steel.**

$\frac{1}{2}$ x $\frac{3}{8}$ in. and larger, \$3.00
--

**Spring Steel.**

$\frac{3}{8}$ to $1\frac{1}{2}$ in. Rounds, Op. Hearth \$3.00, Crucible \$5.00
$\frac{1}{4}$ to $\frac{1}{2}$ in. by No. 4 gauge to $\frac{1}{2}$ in. Flats, 3.00, " 5.00

**Carriage Bolts. (Net Price per Hundred).**

$\frac{1}{2}$ x 2 in., \$0.54	$\frac{3}{8}$ x $2\frac{1}{2}$ in., \$0.82
$\frac{1}{2}$ x $2\frac{1}{2}$ in., .58	$\frac{3}{8}$ x $3\frac{1}{2}$ in., .96
$\frac{1}{2}$ x 3 in., .62	$\frac{3}{8}$ x 4 in., 1.31
5-16 x 2 in., .65	$\frac{1}{2}$ x 4 in., 1.70
5-16 x 3 in., .75	$\frac{1}{2}$ x 6 in., 2.10

**PATENTS**

Write at once for most liberal offer ever made for obtaining patents and ask for Inventors' Guide, the best book published Est. 20 yrs. W. M. MOORE, Wash. D. C.

**CUMMINGS & EMERSON**

Blacksmith and Wagon Makers' Supplies,

PEORIA, ILL.

**The Campbell Iron Co.**

ST. LOUIS, MO.

Carry complete line of Horseshoers' Supplies, Wagon and Carriage Material.

WESTERN AGT. FOR DITZLER COLORS IN JAPAN.

Write us your requirements.

**BOLSTER SPRINGS.**

ALSO WAGON SEAT,

Truck and Platform Springs. Catalogue Free.



Sold by Leading Jobbers or write us.  
**HARVEY SPRING CO.,**  
RACINE JUNCTION, WIS.

**AUTOMATIC YOKE CENTRES**

Readily replace broken leather centres. Sold by leading hardware and saddlery jobbers everywhere.

**AUTOMATIC YOKE CO.,**  
Address Desk H, Indianapolis, Ind.

**RUBBER STAMPS STEEL STAMPS AND STENCILS**

SEND FOR CATALOGUE.

**A. C. GIBSON CO.,**  
338-340  
WASHINGTON STREET  
BUFFALO, N. Y.

**WANTED AND FOR SALE.**

Want and for sale advertisements, situations and help wanted, twenty-five cents a line. Send cash with order. No charge less than fifty cents

**FOR SALE**—Blacksmith shop and house. Address J. J. DEATWYLER, Sardis, Ohio., Route 1.

**DON'T BUY** a blacksmith and wood shop without getting interesting information from P. O. BOX 132, Dardanelle, Ark.

**FOR RENT**—Blacksmith shop on railroad. No competition. Best location in the State. Address R. L. WILSON & CO., Solon Mills, Ill.

**FOR SALE OR RENT**—Shoeing and general blacksmith shop at a bargain. Good business. Address ANDREW JOHNSON, Box 225, Cambridge, Ill.

**WANTED**—To buy stock and tools and rent a two man shop in locality having good prices, in New York State. DANIEL FERRON, Romulus, N. Y.

**FOR SALE**—Blacksmith and repair shop. Good location and established business. Will give free trial. Write today. J. RANZ, Sapp, Mo.

**WANTED**—I want a good steady wagon smith for new and old work on business wagons. Steady job and good wages at JOHN M. MAYER, Kingston City, (Rondout), N. Y.

**FOR SALE**—Blacksmith shop, stock and tools. Will invoice \$600.00. Price \$500.00. Good location for right party. No other need apply. Write to T. E. LARSON, Peruville, Ill.

**FOR SALE**—Blacksmith and wagon shop with contents, power and machinery, good town, fine farming country. Only shop in town. GEO. A. MIRKEL, Gervais, Ore.

**FOR SALE**—Blacksmith, shoeing and jobbing business in country town, no competition. Rent of shop \$6.00 per month, price \$450.00; \$350.00 down, balance on time. Address P. O. Box 20, Acton, Mass.

**FOR SALE**—The Cole Wagon and Carriage Shop, Horseshoeing Department in connection. Building 44x50, two fires, fine location, the division of the White River Road. No competition. Reason for selling loss of eye. Address N. A. COLE, Crane, Mo.

**FOR SALE**—Modern up-to-date wagon and repair shop 30x60 ft.  $1\frac{1}{2}$  stories high, 10 H. P. Howe gasoline engine, equipment of tools and machinery, established trade in a good and large territory; also dwelling adjoining shop. Situated on main street of town of about 600 inhabitants. For further inquiries address J. H. BLISS & SON, Stewart, Minn.

**WANTED**—Salesmen and Agents in all Eastern and Gulf States, and foreign countries on percentage, to sell our Gasoline, Kerosene and Marine Engine and Producer Gas Plants.

We have an attractive proposition to offer. **MODEL GAS ENGINE WORKS, B-21 Produce Exchange, New York U. S. A.**

**FOR SALE**—An established coach factory in good location. Buildings in good repair. These shops enjoy a very liberal patronage of the surrounding community being the oldest stand in the city; under the management of the undersigned for the last 49 years. Owner wants to retire on account of age. Address W. C. FAUBER, Lebanon, Pa.

**FOR SALE**—One of the best equipped shops in Denver. Will sell blacksmith shop 20x75 feet, wood shop 23x75 feet, each one story brick, up-to-date tools and machinery, also store buildings with living rooms above, all for nineteen thousand dollars. Reasonable terms, nine thousand down, balance in ten years time. Or will sell complete equipment, tools and machinery for three thousand dollars. Shop and five living rooms rent for \$25.00 per month. Other buildings now bringing \$100.00 per month. For full particulars address **SHOP OWNER, 1447 South Broadway, Denver, Colo.**

**BLACKSMITHS TAKE NOTICE**—Be an up-to-date mechanic and expert steel worker. Don't waste time learning the trade in the old-fashioned way but get Toy's Treatise on new steels explaining how to work them with 75 new methods for working all difficult jobs. Ten receipts for making your own compounds for welding different kinds of steel slid. Thermite welding fully explained; also two colored tool tempering charts; chart A explains all annealing and hardening; chart B explains both scientific and plain tempering to a standard. Forty years as steel worker. All the above in pamphlet form for \$1.00. Valuable samples free. W. M. TOY, Sidney, O.

**OHIO BLACKSMITH SHOP FOR SALE**

—In city of 10,000 with many livery stables. Shop, house, 2 lots, each 50 by 150. 2 fires, brick forges. Stock and tools for fine business owner is doing. 8 room house. In business 40 years; must retire. \$2400. Blacksmith and wagon shops in many States. Some will exchange. HILES & MYERS, A25 Matthews Bldg., Milwaukee, Wis.

**PATENTS**

Herbert Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C., established 1883; I make an examination free of charge and report if a patent can be had; also the exact cost. Send for circular.

**PATENTS**

Send sketch or model for free examination and report as to patentability. Patents promptly secured. Advice free: terms low; highest references, and best service. Address,

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Registered Patent Attorney, WASHINGTON, D. C.

**\$60** GOES LIKE SIXTY SELLS LIKE SIXTY

**GASOLINE ENGINES**

for Pumping, Cream Separator, Churn, Washing Machine, Ice Cream Freezer, etc. Send for catalogue. GILSON MFG. CO. Port Washington, Wis.

39 Park Street.

**THE Williams Hardware Co.**

Minneapolis, Minn.

**Wholesale IRON, STEEL and HEAVY HARDWARE.**

**CARRIAGE AND WAGON WOODSTOCK.**

**HORSESHOERS' SUPPLIES.**

Send us a Sample Order.

**BLACKSMITH'S FRIEND****TIRE SETTER.**

The only tool that will pull on a heated tire and finish it. Saves the time, keeps them from splitting, saves time, patience, gives satisfaction and is fully guaranteed. Weighs 15 lbs. with four foot handle. Tire can be heated warm enough on the forge.

**PRICE, \$4.50. Cash with order.** Remit \$1.00 if sent C. O. D. Circulars free. Plymouth, 9-18-05.

We are using the Blacksmith's Friend Tire Setter and are glad to say it does the work. Just try one of these tools and you'll not be without it. H. C. Love and Son.

**SILCOTT'S PATENT IRON AND ADJUSTABLE FIRE POT.**

It works automatically. Construction simple and reliable. The valve cuts off suction of gas into pipe or bellows. It does not clog up. The bottom of bowl is open. Ashes pass through. The speed of a smith depends on a good fire. Heats directly in center, produces clean white heat. It will not burn out, as it is air cooled. It holds fire from 3 to 6 hours when not in use. **PRICE \$5 to \$8.** No. 2, the size mostly used, complete, \$6. A No. 2 Ture Iron, Pot and tire Setter, complete, \$10.



**GEO. W. TINKEY,**  
Richland Co., PLYMOUTH, OHIO.

# A GUARANTEED HOOF CURE

## Mr. Blacksmith

Would you be interested in learning how to pick up a good many extra dollars in your business with very little extra work? Would you like to increase your business—make it bigger—make more money and make more satisfied customers? You can do it and do it easily with

## O. K. Hoof Remedy

Hundreds of blacksmiths are doing it today and so can you. We want you to sell and recommend O. K. Hoof Remedy to your trade, and this is how we suggest you do it: First, we want you to test it. We want you to KNOW from actual experience what it will do so that you will have confidence in it—so that you will be enthusiastic over its merit. We will stand the risk if it does not do what we claim for it. For example, we offer \$100.00 for any case of Contracted Feet, Corns, Dry, Cracked, Brittle Hoofs, Scratches, Sores, Thrush and Quarter Cracks if fails to cure except in funder when used as directed. We do more—we say to you, and you can say to your customers, back goes your money if it fails. You take no risk. Send 15c for trial can and get our special liberal terms to blacksmiths. We want you to handle this remedy in your locality. You can sell lots of it and make money. Send today and "clinch" the agency.

THE O. K. STOCK FOOD CO.  
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O.K. HOOF REMEDY  
KEEPS HOOFS O.K.

## Something to Notice.

Instead of being able to use the dies (four to a set for each diameter) for our tools for just the diameter marked on them, one



can thread

"DUPLEX" DIE STOCKS.

two or three besides, because of their wide adjustability, thus covering several over sizes and a little under size.

Manufactured by

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50 Wood Street,  
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## YOU JUDGE

Invest in some good books and then judge for yourself if it doesn't pay. Their pages tell you how to do many a difficult job. You cannot afford to be without these:

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A most valuable treatise upon forge work by John L. Bacon. The book is profusely illustrated and contains chapters on welding, upsetting, drawing out, bending, metallurgy and calculation of stock, also tables and formulas. It has over 250 pages and is very neatly bound in red cloth. Price, \$1.50

### Modern Blacksmithing

is a well illustrated book on general smithing by J. G. Holmstrom, a practical smith. It tells how to make but her knives, hammers, chisels, plowshares, wrenches, etc. Contains chapters on case hardening, babbitting, drilling and welding. Contains over 200 pages and is handsomely bound in half-leather. Price, \$1.00

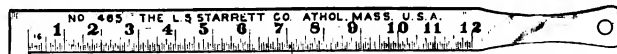
### Practical Carriage and Wagon Painting.

A very complete treatise on the painting of vehicles by M. C. Hillick, a master in the art of vehicle painting. The book is just filled with sound, practical information. Fully illustrated and bound in red silk, library cloth. Contains over 150 pages. Price, \$1.00

Any of the above books will be sent postage prepaid upon receipt of price.

**American Blacksmith Co.**  
P. O. Drawer 974. BUFFALO, N. Y.

## BLACKSMITHS' HOOK and HANDLE RULE



Made from hard rolled sheet brass one-tenth in. thick, one and one-sixteenth in. wide, with heavy graduations and figures, graduated from the end in sixteenths of an inch on one side and from the inside of the hook in sixteenths of an inch on the other, adapting them for taking correct measurements from either the outside edge of a hot piece of iron, or from the inside when held against a corner. Graduated twelve inches, have flat handles and measure over all 16 1/4 inches.

Price, postpaid, \$1.15.

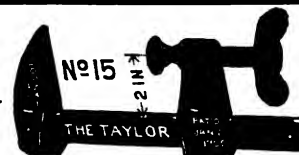
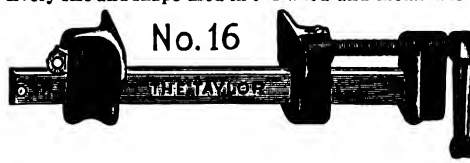
Catalogue of Fine Tools Free.

**THE L. S. STARRETT CO., Athol, Mass.**

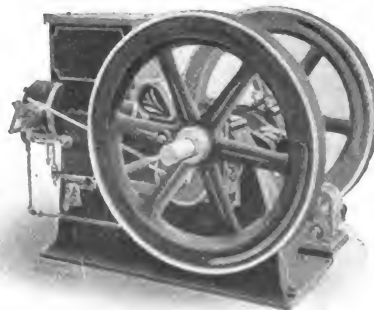
## TAYLOR CLAMPS.

Quick-Acting, Self-Locking.

Every size and shape used in the wood and metal working trades.



Get our Catalogue before placing your next order.  
**JAMES L. TAYLOR MFG. CO.,**  
Bloomfield, N. J.



## 5 H.P. SPECIAL \$162.50 GASOLINE ENGINE

From Factory Direct to User.

Why pay more money and get an engine of less value? Equipped with mechanical Oilier and Magneto Dynamo. There is none better. Ask for description and liberal offer.

**SPADE ENGINE CO.,**

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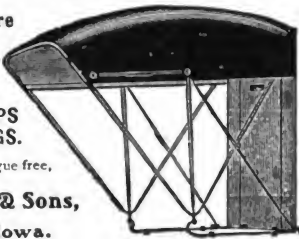


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a Complete  
Line of

CARRIAGE TOPS  
and TRIMMINGS.

Illustrated catalogue free,  
Write to-day.

D. A. Laros & Sons,  
Grinnell, Iowa.



## RUBBER TIRES

Strictly First Quality.

When Cash accompanies order, Price,

Per set for size 1 1/4 inch..... \$14.50  
Per set for size 1 3/8 inch..... 17.00  
Per set for size 1 1/2 inch..... 21.00

WRITE FOR SAMPLES

—ADDRESS—

The A. Armstrong Co.,  
719-723 State Ave.,  
CINCINNATI, OHIO, U. S. A.

### Trade Notes and Literature.

CATALOGUE NO. 25 just issued by the Boob Wheel Company of Cincinnati, Ohio, contains interesting prices on sarven patent wheels and Standard rubber tires. This firm also sent us a special net price list on wood and wire wheels which would interest our readers and is well worth writing for.

THE PARRY MANUFACTURING CO., of Indianapolis, Ind., manufacturers of the well known Parry buggies claim to have the largest and best equipped factory in the world. Every vehicle that this firm puts out is fully guaranteed to contain only the finest material and best workmanship.

IN OVER 50,000 CARRIAGE SHOPS in the United States, West's carriage dressing is said to be in constant use. West's dressing, it is claimed, is water proof, will protect the surface, prevent cracking and make any old top look like new. The merits of this article may be appreciated when it is understood that West's dressing has been used by the trade for over thirty-five years.

DO YOU MAKE YOUR BLACKSMITH SHOP PAY? This is the title of an interesting booklet received from the Philipps-Laffitte Company, Philadelphia, Pa. The book gives many practical examples of how the smith can increase his profits by repairing broken castings and tells of many advantages of the well known Laffitte welding plates. Readers who are interested in this profitable work should write for a copy of the book.

THE POPULARITY OF THE REYNOLD'S AXLE GAUGE is growing daily as will be noticed by referring to the advertisement of the E. T. Buhl Mfg. Co. on page 49. A large number of the leading shops throughout the country are now selling this gauge, which proves to every user that it is one of the most handy tools for the shop. By dropping a postal card to the E. T. Buhl Mfg. Co., Cleveland, Ohio, you will receive interesting circulars giving a detailed description of this handy gauge.

THE STANDARD HORSE NAIL CO., of New Brighton Pa. have contracted for an addition to their plant, 166 feet by 45 feet, a brick building with truss and slate roof. The popularity of "Standard" and "New Brighton" horse nails and the increasing demand for these excellent goods have made it necessary for the Standard Horse Nail Company to enlarge their already extensive plant. We are also advised that recently this company has been obliged to run their factory overtime until 9 P. M. daily in order to catch up with the demand for their nails.

A NEW GAS AND OIL TIRE HEATER has been put on the market by The Gogel Mfg. Co., Toledo, Ohio. We have received an interesting catalogue, fully describing this machine. It is built to heat tires as hot as desired and at a very small cost. It is said that the cost of fuel for heating has been reduced to a minimum by this machine. The burners, swivels and valves are of toughest brass and all pipes extra heavy. A copy of the booklet illustrating and describing this excellent heater will be sent free upon request.

ATTENTION, of readers, is called to the advertisement of Cray Bros. on page 47. This firm claims to be selling supplies at prices lower than those of any other supply house in the country. Cray Brothers are in a position to quote our readers very low prices as they do a strictly mail order business, have no traveling men's expenses to add to the cost of their goods and since they sell strictly for cash, do not have to take into account the

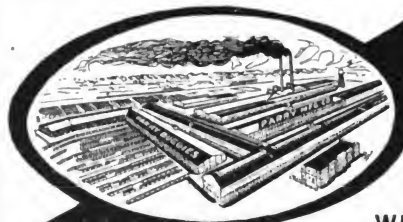
"Tools That Wear"

## HELLERS' CELEBRATED AMERICAN HORSE RASPS FILES AND FARRIER'S TOOLS

will save you Time and Money. Their Superior Quality sets a known and tested Standard of Excellence. All made from our own Production of Special Refined Clay Crucible Steel and tempered by a Secret Process. New Catalogue Mailed Free on Application.



HELLER BROTHERS CO., Newark, N. J., U. S. A.



## PARRY BUGGIES

LARGEST AND BEST EQUIPPED  
CARRIAGE FACTORY IN THE WORLD.

EVERY VEHICLE  
ABSOLUTELY  
GUARANTEED.



WE MAKE THE PRICE.  
We also sell HIGH GRADE

BUGGY & SURREY WHEELS AT LESS THAN  
FACTORY PRICES.



PARRY MFG. COMPANY, INDIANAPOLIS,  
INDIANA. U. S. A.

## KELLER ECCENTRIC BRAKE

Warranted to lock wheels with three ton load with ease; can be applied to any wagon. Works without aid of ratchet. Made in two sizes.

Note its construction, sturdy and serviceable.

Blacksmiths, wagon and buggy repairers especially, will see at a glance the merits of this axle cutter and appreciate its usefulness.

It will cut a pipe, boiler tube or shaft, as little or as much as desired and do its work accurately, taking the merest shaving from the end or cut in two at any point, its bearings being all on one side of the knife. Attractive propositions offered to live agents.



Write for details

Write for Particulars and Interesting Circulars.

Keller Mfg. Co., SAUK CENTRE, MINNESOTA.

## ENOUGH SAID

### THE WONDER DISC SHARPENERS

Are being used in 24 States, in Canada and Mexico. Have you a Wonder Disc Sharpener in your shop? Do you want to make money easy? From \$20 to \$25 per day earned with the Wonder Disc Sharpener.

FOR SALE BY  
LEADING JOBBERS.

MANUFACTURED BY

A. E. DURNER,  
EVANSVILLE, WIS., U. S. A.

Write for descriptive circular and price list.

losses from bad debts. The catalogue that this firm has just issued is one of the most complete books of the kind that has ever come to THE AMERICAN BLACKSMITH offices and we are sure that our readers would find this catalogue a very valuable reference book to have in the shop. A copy will be sent free, to any AMERICAN BLACKSMITH reader upon request.



In looking over our ledger we are gratified to find that some of our most prosperous agents started in as blacksmiths, handling the Moline Wagon on the side. \* \* \*

They had the acquaintance of the farmers just as well as the dealer in town and soon discovered that being in business paid better than working at the forge, and so have quit the trade long ago, finding themselves prosperous merchants today. \* \* \*

We have some uncovered territory and if you have an ambition to get on in the world, it may be that this is the opportunity for you. \* \* \*

Address,  
MOLINE WAGON COMPANY,  
MOLINE, ILL.



## Buffalo Tire Upsetters

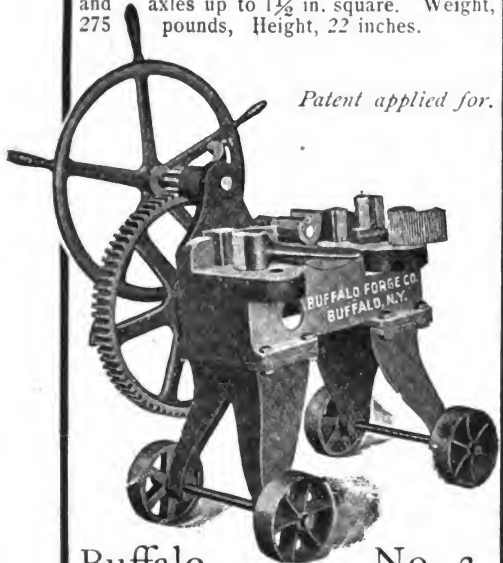
Buffalo No. 2  
Tire Upsetter



Patent applied  
for.

**BUFFALO NO. 2 TIRE UPSETTER** is a heavy cast-iron machine. Grips are of crucible steel with machine cut teeth. The plunger seen between grips is brought down on work and prevents kinking or buckling. Upsets  $3 \times \frac{3}{8}$  in. tires, and axles up to  $1\frac{1}{2}$  in. square. Weight, 275 pounds, Height, 22 inches.

Patent applied for.

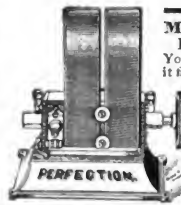


Buffalo No. 3  
Tire Upsetter

This is a powerful edge grip machine. Grips are faced with tool steel. Operates by a windlass and reduction gears. Upsets tires up to 6 in. wide. Capacity,  $6 \times \frac{1}{4}$  in. tires or  $2\frac{1}{2}$  in. axles. Removable cam between grips prevents kinking. Also provided with removable anvil piece for straight work. Weight, 900 pounds.

Write for circular describing  
both these machines.

**BUFFALO FORGE CO.,**  
BUFFALO, N. Y., U. S. A.  
The Canadian Buffalo Forge Co.,  
Montreal, Canada.

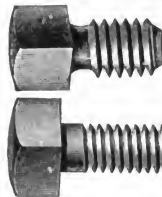
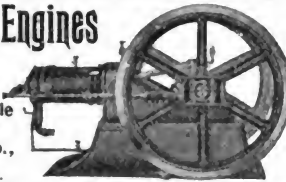


**MILLER'S QUICK ACTING MAGNETO, \$9.00**  
You pay no money until you have tried it five days, and then if satisfactory pay for it, if not return to us. Miller's Vibrating Jump Spark Coil \$4.50 sold same way. M. A. porcelain plugs 50c. Yanka Mica Plugs \$1. \$2.25 buys one pair good bicycle tires any size.  
**Chas. E. Miller**  
1235 Meridian St., Anderson, Ind.

### Simplicity Engines

All Sizes  
Get our proposition.

Western Malleable  
and Grey Iron  
Manufacturing Co.,  
8-20 Chase St.,  
MILWAUKEE, WIS.



**WESTERN TOOL CO.,**  
Lansing, Mich.  
**OFFER A FEW  
SNAPS**

100 assorted Set Screws  $\frac{1}{4}$  to  $\frac{5}{8}$  inch \$1.00.  
100 assorted Cap Screws  $\frac{1}{4}$  to  $\frac{1}{2}$  inch \$1.50.  
100 assorted Machine Bolts  $\frac{1}{4}$  to  $\frac{3}{4}$  inch \$1.50.  
100 assorted S. F. Tapped Nuts \$1.00.

100 assorted Spring Cutters 20c.  
100 assorted Machine screws 25c.  
12 Small Taps no two alike 75c.  
25 Small Drills no two alike \$1.00.  
15 assorted Files no two alike, 4 to 10 inch \$1.00.  
3 H. P. Brand New Gas Engines \$75.00.  
10 H. P. Engine cheap.  
\$25.00 Automobile Bodies \$10.00.  
Sta-Rite Spark Plugs 60c.  
5lb. box Best Welding Compound 30c.  
6 inch Alligator Wrenches 5c.  
5lb. Pail Auto Grease 40c.



10 inch Stillson Pipe Wrench 70c.  
Rubber Belt  $1\frac{1}{4}$  inch  $2\frac{1}{2}$  c, 2 inch 4c, 3 inch 6c.  
Malleable Hinge Pipe Vice \$1.33.

**WESTERN TOOL CO.**  
Lansing, Mich.

Do you want Job Lot List?  
It will save you money.

## YOU LOSE TRADE.

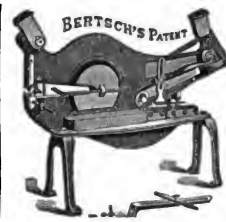
because of the little things in the business. There is little difference between one man and another, but that little counts for a great deal. It is the little things that count.

We have been making dry batteries for eighteen years and every year we have tried to make them a little bit better than the year before. In doing so we think we have helped to lessen ignition troubles, and helped the gas engine business.

The "Acme 16" dry battery is one of the little things that make for perfection. Try it.

**The NUNGESSER  
ELECTRIC  
BATTERY CO.,**  
27 King Street,  
Cleveland,  
Ohio.

General Sales Office,  
128 W. Jackson Bldg.,  
CHICAGO, ILL.



**We Manufacture  
SHEARS  
AND  
PUNCHES**  
Hand or power, for  
shearing and punching  
plates, bars and angles.  
Send for Catalogue C.  
**BERTSCH & CO.**  
Cambridge City, Ind.

## FREE SAMPLE

OF

## Laffitte Welding Plate

SENT ON REQUEST

Test it by face welding two old files and punching a hole through the weld, thus proving our

### Claim of Welding at a Low Heat

high carbon steel with all the strength of a solid piece, effect a saving of one-third in time and fuel and you will never lose a heat.

**WHY Do Government and Rail  
Road Shops use them?**

**WHY Does the Country Smith use  
them?**

Send for Sample and find out.

**THE PHILLIPS-LAFFITTE CO.,**  
Pennsylvania Bld., PHILADELPHIA, PA.  
For sale by live dealers.

## A TURN FOR THE BEST

Every dealer turns profits his way when he takes on a line of

### EUREKA VEHICLES

Everything that goes into them is the best we can buy or make. This means that your customers will be pleased with them. You will get compliments instead of complaints.

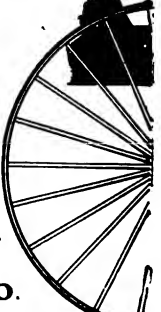
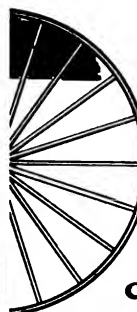
Easy to sell because quality is high and prices are low. Profitable because quickly sold on liberal margin. Write to us and let us tell you.

Wheels in the white or finished complete, with or without rubber tires.  
Buggy Tops in all sizes, grades and prices.

LOOK UP

**New Eureka  
Carriage and  
Harness Co.,**  
CINCINNATI, O.

Address H. A. BEHAN, Manager.



## PATENTS

TRADEMARKS. COPYRIGHTS.  
TWENTY-FIVE YEARS ACTIVE PRACTICE.  
SPECIALTY: "Working on  
the Failures of Others."  
Rejected and difficult cases solicited.  
**SIGGERS & SIGGERS, (Patent Lawyers),**  
Suite 15, N. U. Bldg., Washington, D. C.

### "BOSS" Leather Aprons



THEY  
Outwear  
Six of the  
Ordinary Kind.

**STRONGEST  
and most  
DURABLE.**

Made  
of Cow  
Hide,  
Purely  
Bark Tanned  
Soft and  
Pliable.

#### ASK YOUR JOBBER For the "BOSS" Leather Apron.

If he cannot supply you, send order to us. On receipt of price we will ship a perfect "BOSS" Apron, prepaid, or will send it by Express, C. O. D., giving you the privilege of examining it. If it does not meet every requirement, return at our expense.

#### PRICES.

"The Boss," Size X, 30x36 in. \$1.50	"The Boss" with Bib Size D, 30x42 in. \$1.75
"A, 26x33 in. 1.25	"E, 28x38 in. 1.50
"B, 24x30 in. 1.10	"F, 26x34 in. 1.25
"C, 24x27 in. .85	

**EDMUND C. BECKMAN,**  
Sole Manufacturer,  
712 N. Fourth St., ST. LOUIS, MO.

**HIGH-GRADE BUGGIES**  
**\$47.50**  
AND UP.  
Dealers  
Only.



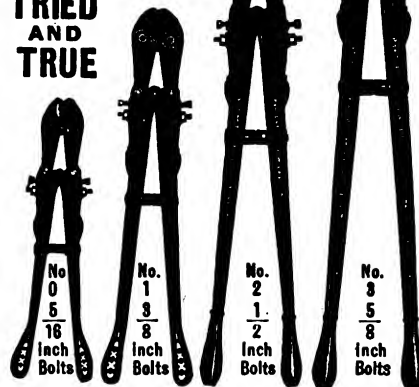
Strictly  
First-  
Class  
Material.

**JAMES & MEYER BUGGY CO.**  
Write for Catalog and Prices. Lawrenceburg, Ind.

### "NEW EASY" BOLT CLIPPERS

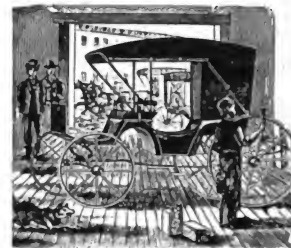
**H. K. PORTER**  
SOLE M'FR  
EVERETT, MASS.

**TRIED  
AND  
TRUE**



**REFUSE CHINESE IMITATIONS OF THESE  
TOOLS; THEY ARE INFERIOR.**

**West's Dressing** has stood the test  
for 35 years.



Will not  
crack or  
injure the  
finest  
leather.

Sold by  
Dealers  
Every-  
where  
or  
Address.

**WEST MANUFACTURING CO.,**  
127 N. Madison St., Rockford, Ill.

## BEST ROUTE To the Northwest.

**Chicago, Milwaukee & St. Paul Railway**

In going to St. Paul, Minneapolis or the Northwest see that your ticket west of Chicago reads via The Pioneer Limited on the Chicago, Milwaukee & St. Paul Railway—the route over which your letters go. Standard and compartment sleepers with longer, higher and wider berths. Leaves Union Station, Chicago, 6.30 p. m. daily; arrives St. Paul next morning at 7.25 and Minneapolis at 8.00 o'clock.

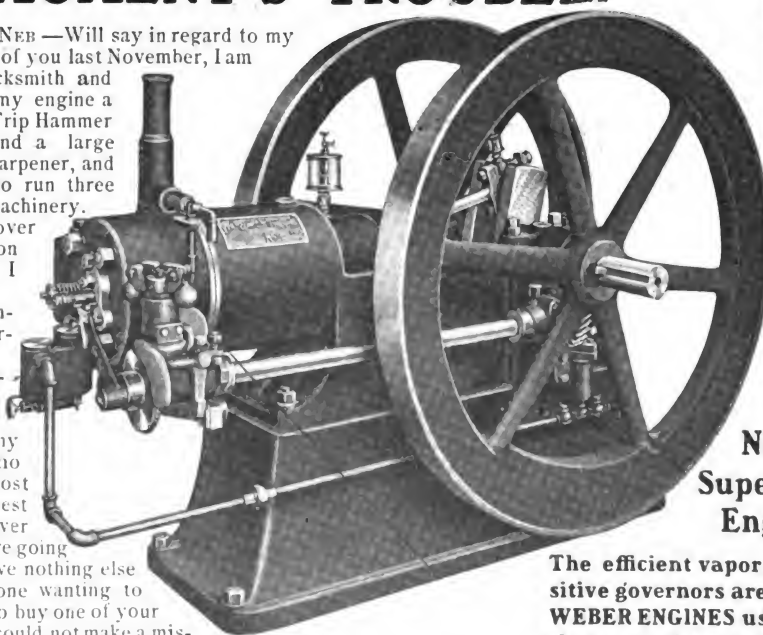
### GO NOW TO CALIFORNIA.

Via The Overland Limited on the Chicago, Milwaukee & St. Paul Railway. Less than three days en route. No change of cars. From Union Station, Chicago, at 8.00 p. m. daily. Descriptive folder free.

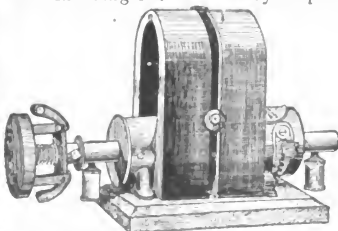
**F. A. MILLER,**  
General Passenger Agent, Chicago.

## NOT A MOMENT'S TROUBLE.

BEAVER CROSSING, NEB.—Will say in regard to my 6 H. P. Engine bought of you last November, I am running a general blacksmith and repair shop and use my engine a great deal. I run a Trip Hammer and Emery Wheel and a large Press Drill and Disc Sharpener, and have power enough to run three times that amount of machinery. I have run my engine over 15 hours by the watch on 5 gallons of gasoline. I have never turned a nut or bolt on my engine yet and it is in perfect condition and has never given me one second's trouble. For simplicity I don't think it can be excelled in any way. Every one who sees it says it is the most perfect and smoothest running engine they ever saw. Would say if I were going to buy again would have nothing else and would advise anyone wanting to buy a 6 H. P. engine to buy one of your 6 H. P. engines as he could not make a mistake in doing so.

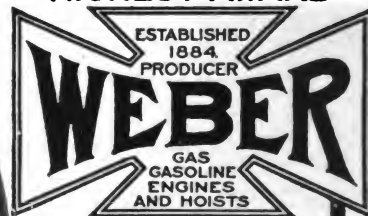


Very respectfully yours,  
J. H. McCORD.



A Weber Pat. Tubular Magneto will save its cost in a few weeks. Replaces batteries entirely, and your engine will give more power and run better.

### HIGHEST AWARD



**GOLD MEDAL**

We build WEBER PAT. suction Gas Producers and Gas Engines up to 1000 H. P. Run on coal, burn 1 lb. per Horse Power Hour. Cost 1-4 cent.

**Notice the Mechanical  
Superiority of the Weber  
Engine over all Others.**

The efficient vapor mixer and high-speed sensitive governors are two of the reasons why all WEBER ENGINES use less fuel and run steadier than any other make.

**Weber Gas &  
Gasoline Engine Co.,**

P. O. BOX V 1114, KANSAS CITY, MO.

Write for complete Catalogue.

New York Offices, 116 Liberty St., NEW YORK, N. Y.

## Little Giant.

### A SIGN OF Strength and Quality BOLT HEADER NO. 8.

This Bolt Header is intended for heavy work, and is furnished with *steel dies* for heading bolts from  $\frac{1}{2}$  to  $1\frac{1}{2}$  inches inclusive. Takes bolts to 26 inches long. A very strong and efficient machine.



Leading dealers everywhere carry "Little Giant" Machines.

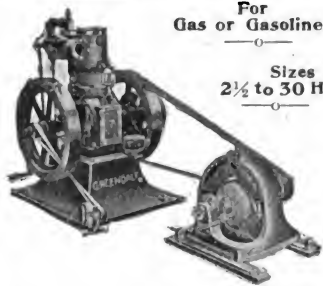
We carry a complete line of Drills, Vises, Bolt Headers, Swage Blocks and Mandrels.

Our Complete Catalogue is free.  
Fully Illustrated.

Write Today.

**B. B. NOYES & CO.**

Greenfield, Mass., U. S. A.



For  
Gas or Gasoline  
—  
SIZES  
 $2\frac{1}{2}$  to 30 H. P.

### Greendale Gas Engines.

THE BEST POWER  
For Blacksmith Shops.  
Also adopted for Electric  
Lighting.

Write for Catalogue A. B.  
**GREENDALE GAS ENGINE CO.,**  
WORCESTER, MASS.

## PATENTS PROTECT YOUR IDEAS

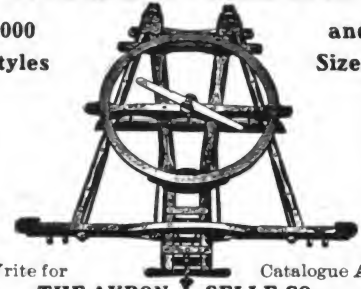
Send for Inventor's Primer. Consultation free. Established 1864.

**MILO B. STEVENS & CO.,**  
852-14th St., Washington, D. C.  
Branches at CHICAGO, CLEVELAND, DETROIT.

### WAGON GEARS

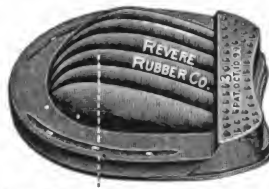
1,000  
Styles

and  
Sizes



Write for Catalogue A  
**THE AKRON SELLE CO.,**  
Akron, Ohio.

## AIR CUSHION RUBBER HORSESHOE PADS



Twelve Different Styles



Heavy  
Leather Back

NO  
LAMENESS  
NO  
SLIPPING  
CHEAPEST  
AND  
BEST



Medium  
Canvas Back

### See That Cushion?

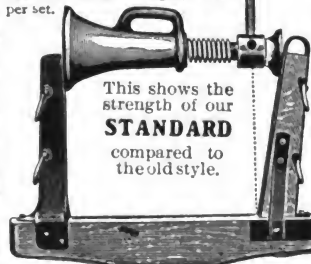
It fills with air at each step. That's what breaks concussion. That's what prevents slipping. That's what keeps the foot healthy. That's what cures lameness.

**REVERE RUBBER CO.**

Sole Manufacturers

BOSTON, MASS.

We make the following sizes:  
No. 1, 3 in. wide, 14 in. high  
" 2, 3 1/4 " 14 "  
" 3, 3 1/4 " 10 "  
Price, \$1.65 per set of 4 stks  
Cash with order. Weight, 16 lbs. per set.



This shows the  
strength of our  
**STANDARD**  
compared to  
the old style.

### The Bruce Malleable Wagon Standard

This Malleable Iron Bolster Standard has been tested thoroughly, and we guarantee it strictly as represented.

Anyone familiar with the farm wagon will readily see the great advantages of the Malleable Iron Bolster Standard over the old style.

1. Made of the best grade malleable iron. It has been thoroughly tested by factories and wagon makers and pronounced a great success.

2. It is attached to bolster by means of two bolts passing through bolster from the side, and one bolt from top to bottom of bolster, thus holding standard perfectly solid, and at the same time strengthening end of bolster, which in old style is weakened by mortise.

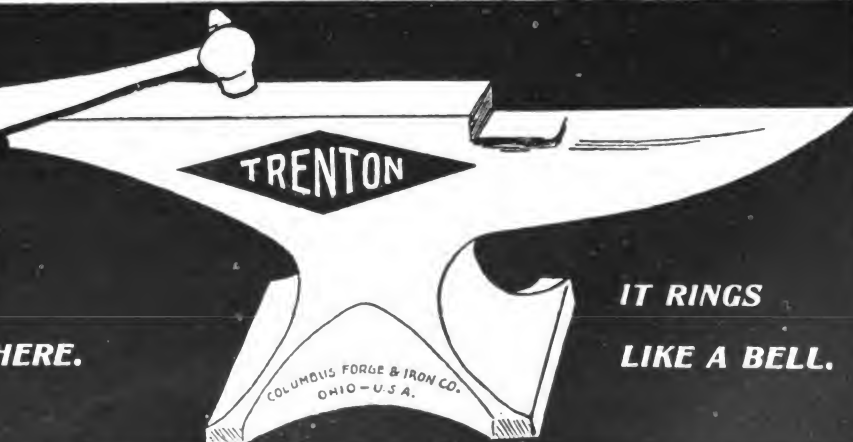
3. The Malleable Iron Standard has a 3 1/2 in. face at base, which prevents wear on wagon box, while the old style has only a 7-8 inch face.

4. Great time saver. Can be attached to bolster in one-fourth the time required to put on wood stake. Adapted to new and repair work. The price will justify all classes of the trade in using this standard.

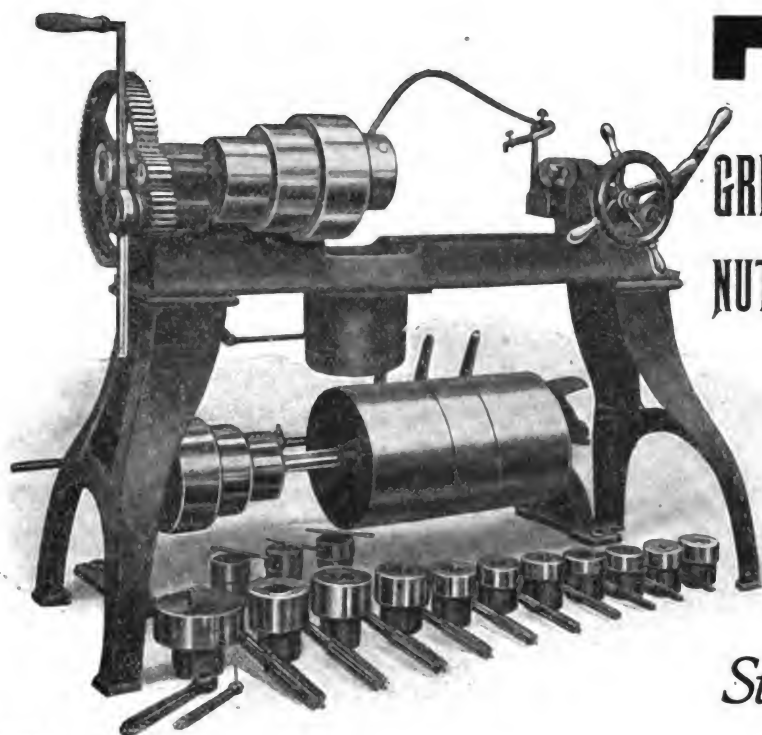
**A. H. HARSHBARGER, Bement, Ill.**



**SOLD BY LEADING  
DEALERS EVERYWHERE.**



**IT RINGS  
LIKE A BELL.**



**NO. 42.**  
**GREEN RIVER BOLT CUTTER,**  
**NUT TAPPER and PIPE THREADER**

A high-classed, moderate priced machine for Blacksmiths and Carriage makers

*Strong and Reliable*

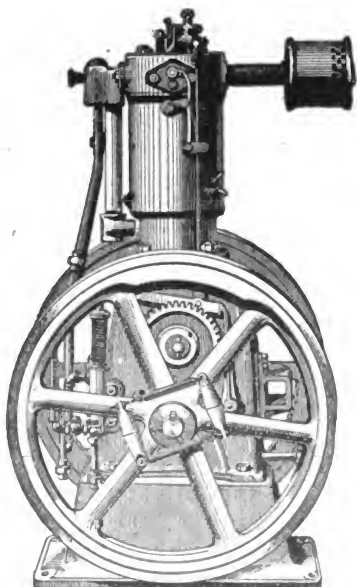
Made By

**WILEY & RUSSELL M'F'G CO., Greenfield, Mass., U.S.A.**

Send for Catalogue No. 33D and our special offer for June

## A WELL CHOSEN POWER

Saves a world of annoyance to the operator. A power is not well chosen that is not simple, reliable, ample for needs, easily kept in order, economical in operation, etc.



Then, it makes a difference what your work is. There are many styles and sizes of engines. See that the one you buy is adapted to the work in hand.

### **The I. H. C. Gas And Gasoline Engine Line**

meets all requirements. Neat appearing, easy running, take little fuel for power generated, so simple they cannot get out of order, so easily understood that anybody can operate them.

**An I. H. C. Engine always responds. Make sure  
of getting the dependable kind.**

You'll find the style and size that will exactly meet your wants. Horizontal, Stationary and Portable in 4, 6, 8, 10, 12 and 15 h.p. Vertical in 2, 3, 4 and 5 h.p. Write for CATALOGUE and investigate.

**THE INTERNATIONAL HARVESTER COMPANY OF AMERICA, (INCOR.)**

No. 7 U Monroe Street, CHICAGO, ILL., U. S. A.



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## SAVE ALL FIGURING!

Tell at a glance how much stock to use for oval or elliptical hoops of any size, the circumferences of circles, weight of flat, square and round stock, and the weight and strength of ropes and chains. Should be in every progressive Smith's hands. Bound very neatly in green cloth. Price, 50c. AMERICAN BLACKSMITH COMPANY, Buffalo, N.Y.



ESTABLISHED 1872.

**M. L. EDWARDS CO.,**  
SALEM, OHIO.

**HAND and POWER DRILLS**  
Hub Boxing Machines, Tuyoers Irons etc.  
Catalog Free.

# THE "ELI" LEADS 'EM ALL



## THE "FOOL-PROOF" GASOLENE ENGINE

The "ELI" Gasolene Farm Engine is the only fit engine to have on a farm, where one is a good way from the repair shop. The "ELI" is so simple that there's nothing to get out of order. It will run year in and year out without the tinkering that other engines require. It is the only engine without cams, gears, and levers. We call it "Fool-Proof" because, if some simpleton or a child should monkey with it, he couldn't make it dangerous. It's absolutely safe. Isn't that the kind of an engine YOU want? Then write for our free booklet, telling how and why it is so simple and safe. **MOLINE PUMP COMPANY, Sole Mfrs..** **MOLINE, ILL.**

8 YEARS  
WEAR AND  
TEAR

# Metallic Dashes

PROVE  
THEIR  
EXCELLENCE

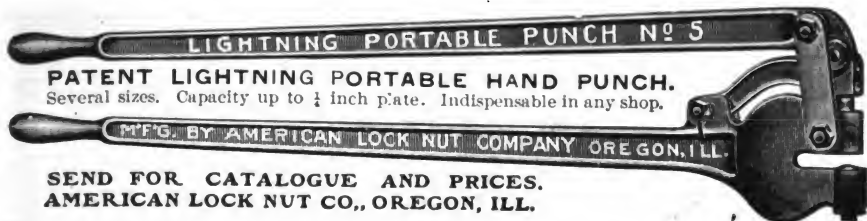


HIGH IN QUALITY  
LOW IN PRICE  
FINISH EQUAL TO BEST PATENT  
LEATHER, BUT MORE DURABLE

For Sale by your Jobber. If not,  
write us.

Send for Catalogue.

**BENNETT MFG. CO., Hunt, N. Y. BOX 506.**



## LIGHTNING PORTABLE PUNCH NO 5

PATENT LIGHTNING PORTABLE HAND PUNCH.  
Several sizes. Capacity up to 1/4 inch plate. Indispensable in any shop.

MFG. BY AMERICAN LOCK NUT COMPANY OREGON, ILL.

SEND FOR CATALOGUE AND PRICES.  
AMERICAN LOCK NUT CO., OREGON, ILL.

## THE "GEM"

INVESTIGATE ITS MERITS.

Get Prices from your  
Supply House.

For Sale by All Jobbers.



## THE "GEM"

IT WILL PAY YOU.

**CONSOLIDATED  
HOOF PAD CO.**

18 Vesey St. NEW YORK.

# "THE BEST OF ALL"

Says one man in referring to

## Plain Gas Engine Sense

The book that tells in a plain, understandable way just what you want to know about your engine. Carefully classified and indexed.

Has over 140 pages and contains numerous illustrations.

Bound substantially in pocket size, Price, postpaid, 50 cts.

Ask for Circular.

**AMERICAN BLACKSMITH COMPANY,**

P. O. Box 974.

Buffalo, N.Y.

# IT DOES THE TRICK! R. F. D. SPECIAL



This axle runs easier than any other, and requires no attention. "It's a Wonder." STANDARD BALL AXLE WORKS, Lancaster, Pa.

## BUILD YOUR OWN GASOLENE MOTOR



We supply the castings, drawings and all accessories. A complete line of rough castings, also finished Motors for Bicycle, Automobile, Marine or Stationary. A 2-cent stamp gets our catalogue.



**STEFFEY MFG. CO.**

2941 Girard Ave., Philadelphia, Pa.

## ONLY 60 CENTS

Did you ever try to shoe a horse that would not stand still? By the use of my great



**Pulley Breaking**  
**Bridle** you can make the most restless horse stand as quiet as a lamb—even ugly horses, stallions, etc., completely subdued while being shod. Price, Only 60c postpaid. You should own one.

Will bring business to you. Send for circular telling all about it. **PROF. J. W. BEERY, PLEASANT HILL, OHIO.**



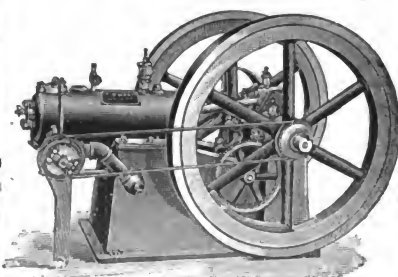
## NOVELTY IRON WORKS BOSS HAMMER

For Plow Work, Wagon Work, Heavy Work, Any Work.

We have been using your Boss trip hammer for over a year and will say that to do without it would end the business for us as we have a great deal of plow work and to go back to the old method of drawing out a share would discourage me so much that I would quit the business. Any man having power should by all means have a Boss hammer. H. J. DUBBS & SON, Ransom, Kas.

G. E. DAVIS, Mgr.,  
DUBUQUE, IOWA.

# HAGEN GAS AND GASOLINE ENGINES



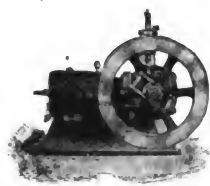
(2-25 H. P.)

ECONOMICAL and RELIABLE POWER FOR THE SHOP-RUNNING BLACKSMITH and WAGON MAKER.

HAGEN ENGINES are recommended on account of their simplicity, durability, comparatively low price, small cost of operating and the ease and certainty with which they can be controlled.

Our Catalogue explains all working parts. A postal will bring a copy to you. It's free. Write today.

**HAGEN**  
**GAS ENGINE AND MFG. CO.**  
Winchester, Ky., U. S. A.



The 1906  
**CUSHMAN**  
3 H. P. 150 lbs.  
6 H. P. 225 lbs.  
Simple, Durable.  
Free Catalogue.  
**CUSHMAN MOTOR CO.**  
Lincoln, Neb.

**TRIMMINGS FOR EVERYTHING ON WHEELS**

Wholesale Manufacturers Write For Catalogue and Prices.

Export Work our Specialty. **INDIANA TOP & VEHICLE CO.,** U.S.A.

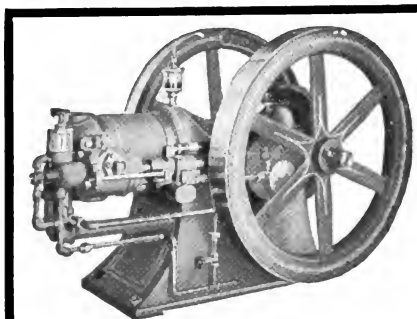
STOPS FROM \$4.00 UP  
Lawrenceburg, Indiana, U.S.A.

**EVERY CHARGE IS FIRED**

**THE Apple Automatic Sparker**

At an instant and you get all possible power out of every explosion when your gas engine is equipped with an **Apple Automatic Sparker**. A dynamo that starts and runs without belts, switches or batteries. Delivers fat, hot sparks without fail. Write for full information to day.

**THE DAYTON ELECTRICAL MFG. CO.,**  
152 St. Clair St., Dayton, Ohio.

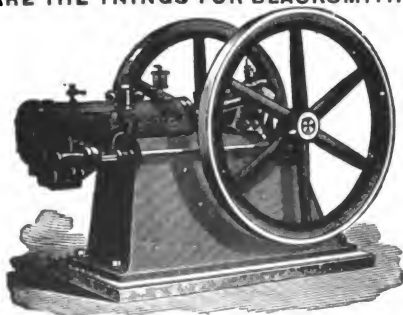


### MICHIGAN FIVE HORSE

A handy, reliable and economical gas engine for the blacksmith or machine shop owner. Every part fully illustrated and explained in our catalogue and every engine guaranteed. Ask for our free book "Proof Positive," showing how the engines are used, and letters from the users. 2, 3½ and 6 Horse Power sizes for light power and farm uses.

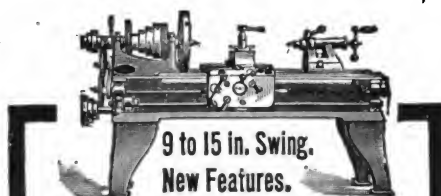
**The Nation Engineering Co.,**  
SAGINAW, MICHIGAN.

**COLUMBUS GASOLINE ENGINES**  
ARE THE THINGS FOR BLACKSMITHS



Send for Catalogue 33, Stating Horse Power You Need.

**COLUMBUS MACHINE COMPANY**  
Columbus, Ohio.



**SEBASTIAN LATHES** are Good Lathes  
Catalogue Free. Sizes 9, 10, 13, 15 inches.

Our engine lathes are provided with both screw and rod feeds as well as power cross feed. Gears to cut all standard threads from 5 to 36 are furnished. Steady and tool lower rests, large and small face plates and countershaft go with each Lathe. Foot Lathes, Tools and Supplies.

**SEBASTIAN LATHE CO.**  
124-126 Culvert Street, CINCINNATI, OHIO.

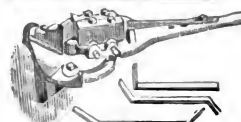
**RUBBER TIRED RUNABOUT, \$36.00**

TOP  
BUGGY,  
\$29.00.



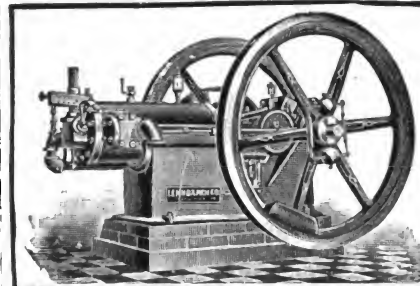
BUGGY  
TOPS,  
\$4.50.

Write for 100-page Catalogue. It's free. Compare Our Prices.  
**BUOB & SCHEU,** Estab. 1883. 500-520 EAST COURT ST. CINCINNATI, OHIO.



**Angle Benders.**

We make hand power Benders for forming angles in stock 1 in. thick and under. Light stock can be bent cold.  
**WALLACE SUPPLY CO.,** 216 GARDEN CITY BLOCK, Chicago.

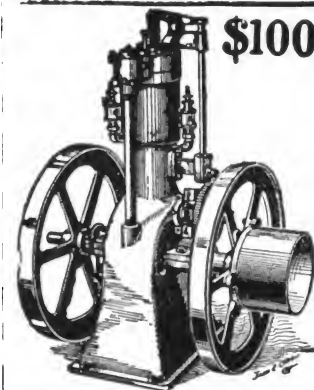


**Lennox Gasoline Engines**  
MADE IN ALL SIZES.

Built especially for Blacksmith shop power. It means money in your pocket to find out about our engines before placing your order.

WRITE AT ONCE FOR NEW FREE CATALOGUE.

**Lennox Machine Company,**  
110 9th Ave., MARSHALLTOWN, IA.



**\$100 The New Pierce Gasoline Motor**  
IS A WONDER.

It will develop more power on less fuel than any other make in the world....

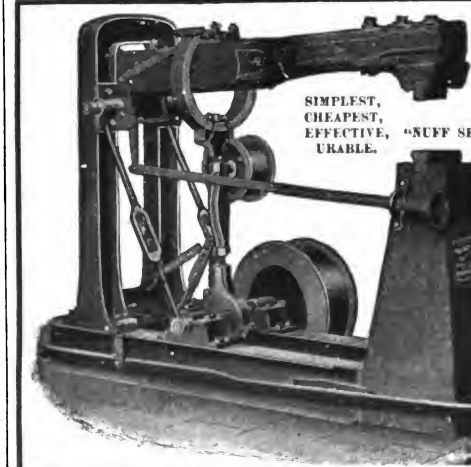
Built on modern lines and up to the very latest practice; made from the best material, and with ordinary care will last a life-time.

We have been building Gasoline Motors for over twenty years. More than 12,000 PIERCE MOTORS are in use in all parts of the world. We know how to, and do, build them right, in fact, we

**Guarantee Them to Give Satisfaction.**  
If they do not, send them back and we will refund your money in full. . . .

The PIERCE MOTORS are the best in the world and cost less than the poorest. We guarantee them against defective material for life. If you want power for any purpose, write for our printed matter, stating your needs. We also build other sizes up to 100 H. P., also Marine Motors, Launches and Auto Boats. Be sure and address

**PIERCE ENGINE COMPANY, - Dept. 12, Racine, Wis.**  
3 1-2 Actual Horse Power.

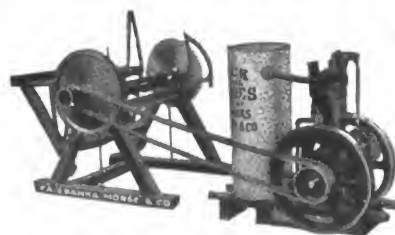


**Hathorn's Hard-hitting Helve Hammer.**

Stroke adjustable while running.

Ask your dealer or write to

**HATHORN  
FOUNDRY &  
MACHINE CO.**  
GRINNELL,  
IOWA.



**Fairbanks-Morse Jack-of-all-Trades**

Gasoline Engine will saw more wood than any other 2 H. P. Gasoline Engine.

It is sent all set up and ready to run.

Awarded Gold Medals at World's Fair, 1904

Cut out complete advertisement and send to

**FAIRBANKS, MORSE & CO., Monroe St., Chicago, Ill.**

Please send me illustrated Catalogue No. H487 Gasoline Engines. I may want.....H. P.

Engine to run .....

Name .....

Street No. ....

Town .....

State .....

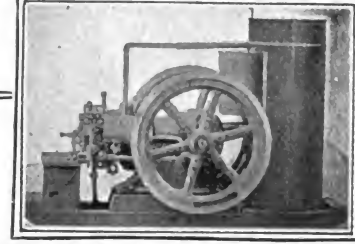
**DEATH TO HEAVES! NEWTON'S**  
 GUARANTEED  
  
 Heave, Cough, Dis-  
 temper and Indiges-  
 tion Cure will effect a  
 permanent cure for the  
 ailments named. Recom-  
 mended by veterinarians  
 and owners. Every drug-  
 gist in America has it or  
 can get it.  
 Send for Booklet.  
 \$1.00 per can, or dealers, or express prepaid.  
 THE NEWTON REMEDY CO., TOLEDO, OHIO.

**CLARKS** DOUBLE ACTION 8 FT. CORN  
 NO MORE USE FOR PLOW  
 SEND FOR CIRCULARS. TETEL CUTAWAY HARROW CO.  
 HIGGAMUM CONN. U.S.A.  
**HARROW**

**HOTTEST ON EARTH.**  
  
 No. 92  
 Double Jet Torch  
 For Brazing Wires  
 on Rubber Tires  
 GUARANTEED  
 Jobbers sell at  
 Factory Prices,  
 \$4.50 net  
**THE TURNER BRASS WORKS**  
 63 No. Franklin St. CHICAGO, ILL.

**SPAVINOFF CURES**  
  
 Spavin, Ringbone, Grease  
 Heel, Sweeney, Windgall,  
 Enlargements, Curb, Galls,  
 Sores, Pollevis, Scratches,  
 Shoe Bolls, &c. Removes un-  
 natural growths and lame-  
 ness, leaving flesh smooth  
 and clean. Testimonials.  
 CHURCH BROS., APTON, N. Y.  
 \$1.00 per Box, by Mail. FOR HORSES AND CATTLE.

**S. N. BROWN & CO.**  
 DAYTON, O.  
 — MANUFACTURERS OF —  
**Vehicle and Automobile Bows**

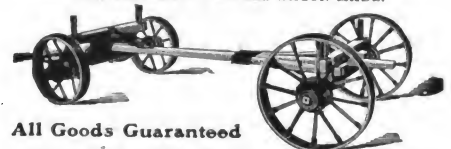
  
 Designed for the  
 Blacksmith. **Our 4 H.P. Engine**  
 Fills every shop requirement and is always ready for  
 business. Giving perfect satisfaction to hundreds of shop  
 owners. Simple, strong, substantial. Best material and  
 finest workmanship. Write for our Catalogue. Sent free for  
 the asking. ROCKFORD ENGINE WORKS, Rockford, Ill.

**THE "BUSH" Low-down Handy Wagon**  
 WITH 4-IN. TIRE STEEL WHEELS  
 Our wagons are well ironed throughout—wheels made with  
 round staggered spokes.



We make any size wheels to fit any skein.  
 We manufacture a complete line of metal wheels for corn  
 planters, cultivators, plows, etc.  
 WRITE TO **C. BUSH, QUINCY, ILL.**  
 (MENTION THIS PAPER.)

**THE GENEVA**  
 — Handy Farm Wagon —  
 THE BEST METAL WHEEL WAGON MADE.



**All Goods Guaranteed**  
 Pressed steel-wheels, any height and width tire, interchange-  
 able hubs. Gears of selected stock, thoroughly-ironed. Made  
 in several styles.  
 WE ARE ESTABLISHING ONE AGENT IN EVERY TOWN.  
 Send for Descriptive Circulars to  
**Geneva Metal Wheel Co.**  
 GENEVA, OHIO

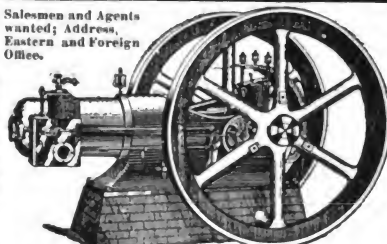


**HENRICKS MAGNETO**  
 Fires your gas or gasoline engine without the aid of batteries.  
 It is better and more durable than any Dynamo. Its Governor regulates the speed  
 regardless of speed of Fly Wheel. Its Governor adjusts to imperfect Fly Wheels. Its  
 Governor insures a constant and uniform spark. The spark does not burn the contacts  
 of the engine. All strains are removed from the bearings of Magneto. FULLY  
 GUARANTEED. AGENTS WANTED.

**HENRICKS NOVELTY CO.**  
 135 S. Capital Avenue INDIANAPOLIS, IND.



**BOLT CLIPPERS**  
 EACH ONE GUARANTEED  
**CHAMBERS BROS. CO.,**  
 N. Fifty-Second Street,  
 Philadelphia, Pa.

Salesmen and Agents  
 wanted; Address,  
 Eastern and Foreign  
 Offices.  
  
 Why buy an experimental gas engine, when for the same  
 money you can buy one that has stood the test for twelve years,  
 and have the further advantage of being able to use it either  
 with gasoline or kerosene. Built in sizes of from 2 to 100 H.P.  
 Write for our large catalogue and prices, if interested.  
**MODEL GAS ENGINE WORKS**  
 Lock Box 2002, AUBURN, INDIANA  
 New York Office, B-21 Produce Exchange.

**Solid Tire Applying Machines.**

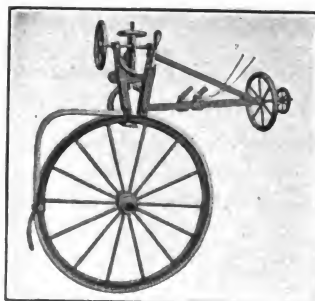
For applying internal and side  
**WIRE TIRES.**

Special Machines built to order.

Write for new, illustrated Catalogue, just  
 out, describing our complete line.

**NELSON AND LE MOON,**

105-107 SO. JEFFERSON ST.,  
 CHICAGO, ILL.



The Original Internal Wire Applying Machine.

**HAND  
 FORGED**



**BUTCHER  
 KNIVES**

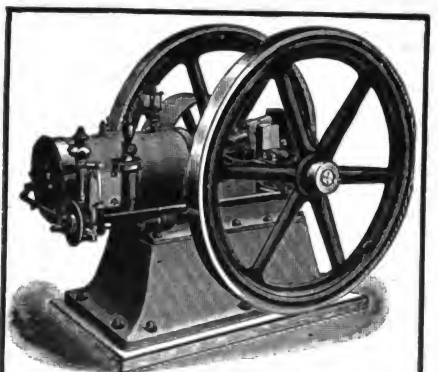
**A GOOD  
 SIDE-LINE**

Hundreds of blacksmiths are making large  
 profits by selling these blades. Each one is  
 fully warranted. Made of Sanderson Steel.  
 Round or riveted. All sizes from 5 to 8 inch.  
 Handles ready to put on, 1c each.

**\$ .15 EACH  
 \$ 1.50 DOZ.**

Hand Forged Razors, ready to use, 40 cents each.  
 Pocket Knife Handles in variety, 10 cents each. Send for sample.

**WOODWORTH KNIFE WORKS, NUNDA, NEW YORK**



**HIGHEST AWARD--GOLD MEDAL**

ST. LOUIS EXPOSITION

FOR

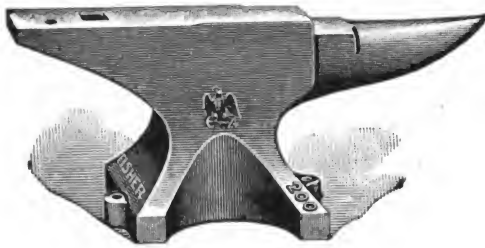
Efficiency  
 Durability  
 Simplicity

Write for Catalogue and Prices.

**BAY STATE GAS ENGINE CO.,**

48 Washington St., North,  
 BOSTON, MASS.



**"EAGLE"****ANVILS.**

1843

1906

We have had over sixty years of Experience in this line and offer you the most reliable Anvils on the Market. Every one Guaranteed.

The Face Consists of a Single Piece of the Very Best Cast Steel Perfectly Welded and of the Hardest Temper. The Horn is made of Tough Untempered Steel and will neither Break nor Bend.

All "Eagle" Anvils made with the Latest Fisher Patent Double Thick Steel on Both Edges of the Face. Made in all Shapes and Sizes up to 1300 lbs. Weight.

WRITE FOR INTERESTING CIRCULARS AND PRICE LIST. SENT FREE.

**EAGLE ANVIL WORKS,** TRENTON, NEW JERSEY.

**PIONEERS**

In the Manufacture of

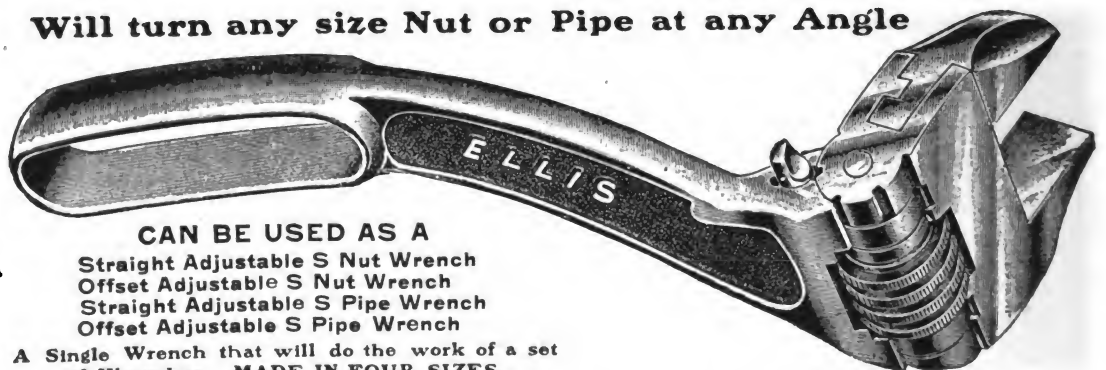
**ANVILS AND VISES OF QUALITY****"Fisher" Double Screw Parallel Leg Vise**

Is sold by Reliable Dealers Everywhere. For Strength and Durability there are none better made. The "FISHER" is acknowledged the best for Blacksmiths



The  
**4 in 1  
Ellis  
Wrench**

Will turn any size Nut or Pipe at any Angle



CAN BE USED AS A

Straight Adjustable S Nut Wrench  
Offset Adjustable S Nut Wrench  
Straight Adjustable S Pipe Wrench  
Offset Adjustable S Pipe Wrench

A Single Wrench that will do the work of a set of Wrenches. MADE IN FOUR SIZES.

**PATTERSON, GOTTFRIED & HUNTER, Limited**

Machinery, Metals, Hardware, Tools and Supplies,

146-150 Center St., Cor. Walker St., N. Y.  
Telephone: 2540 Franklin

Blacksmith's  
Tools.

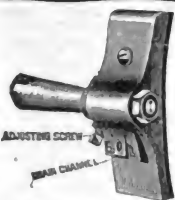
**Scott's IXL ALL High Speed Steel**

Will cut at least one speed faster than any other high speed steel on the market.

Write for Catalog covering entire line of SCOTT TOOL STEELS.

THE  
**BOURNE-FULLER CO.,**  
Cleveland, O.





## Potters Spring Brake Blocks

For Vehicles of all kinds with **STEEL OR RUBBER TIRE.**  
Have a record of excellency for seventeen years. **o o o**

**The MORGAN POTTER CO.**

SOLE MANUFACTURERS.

CATALOGUES.

FISHKILL ON HUDSON, N. Y.

## OUR COLD PUNCHED NUTS

Are used by some of the largest locomotive and engine builders in the U. S. They have been found to be superior in finish and quality. We sell genuine Cold Punched Nuts made from our own brand of iron for this use. With our special process we have been turning out an article that has gained a reputation, and now "Milton" Nuts are specified exclusively by some of the largest users. Having exceptional shipping facilities it will pay you to send us your next specifications.



**THE MILTON MANUFACTURING CO., Milton, Penna.**

We also make Hot Pressed Nuts, Washers, Refined Bar Iron, etc.

## Let Us Send You Our Book.

about good wheels and good wagons that will save you a lot of work and make you a lot of money—the

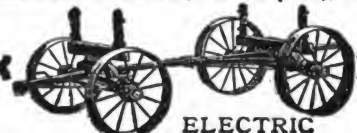
**ELECTRIC STEEL WHEELS**

—and the—

**ELECTRIC HANDY WAGON.**

By every test, they are the best. More than one and a quarter millions sold. Spokes united to the hub. Can't work loose. A set of our wheels will make your old wagon new. Catalogue free.

**ELECTRIC WHEEL CO., P. O. Box A Quincy, Ills.**



**ELECTRIC**

## You Need Wood Working Machinery.

Wood Working Machines in your Shop will enable you to do better work and more of it than you can do with hand tools.

**We Build Just the Machines You Need.**

Catalog describing a fine line of moderate priced **BAND SAWS, SAW TABLES** and **JOINTERS** mailed for the asking.

Send for it now.

**The Crescent Machine Co.,**

245 Main St.

LEETONIA, OHIO.

## We Write Letters BY THE THOUSAND.

We have a process by means of which we can make circulars which look like personal type-written letters.

### A PERSONAL LETTER

is as good as a personal call and costs only 3c including 2c. for postage. Samples and particulars Free.

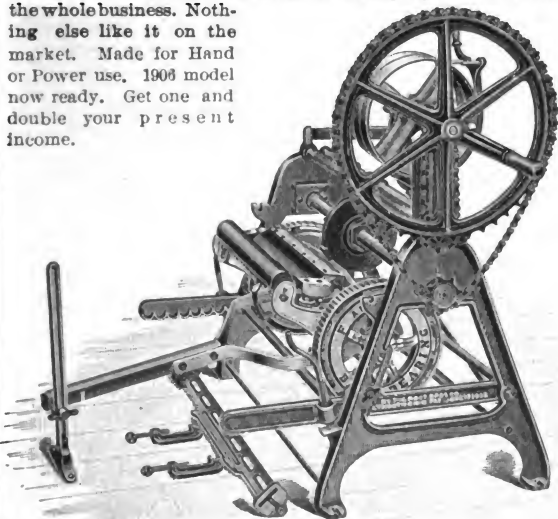
**THE LERNER-BEAN CO.,**

**LETTER SPECIALISTS,**

13½ E. Swan St., BUFFALO, N. Y.

## The "Ideal" Lawn Mower Grinder

Will enable you to grind any lawn mower with absolute accuracy in less than fifteen minutes, without taking apart. Revolutionizes the whole business. Nothing else like it on the market. Made for Hand or Power use. 1906 model now ready. Get one and double your present income.



For full particulars, prices, etc., address the manufacturers,

**THE ROOT BROS. CO. PLYMOUTH, OHIO**

## Cortland Welding Compound Co.

CORTLAND, N. Y.

Manufacturers of

**Climax Welding Compound,**  
**Cherry Heat Welding Compound,**  
and **BORAX-ETTE.**



**BORAX-ETTE** makes steel weld easily. It does not have to be applied between the laps like other compounds, but is used the same as borax. It has no equal for all kinds of steel welding.

**SAMPLES FREE.**

FOR SALE BY DEALERS IN **BLACKSMITHS' SUPPLIES**

TIRE SHRINKER TIRE BENDER

FOR PROGRESSIVE BLACKSMITHS

**IDEAL**

WRITE FOR DESCRIPTIVE CIRCULARS THE WEYBURN CO. ROCKFORD, ILL. U. S. A.

IDEAL

FLOW SHAPE AND OTHER STEEL SHAPES. BLAKESLEY TUVRE IRON

### "High Pressure" Brand No. 2 Brazing Forge



Patented February 7, 1900. The up-to-date machine for brazing agricultural implements, automobiles, bicycles, etc. Will do all kinds of brazing, both light and heavy. It is fitted with three powerful Improved Hydro Carbon Burners. Both Gasoline and Kerosene Machines in stock. Write for description.

THE NATIONAL CEMENT AND RUBBER MFG. CO.  
305 MONROE STREET, TOLEDO, OHIO, U. S. A.

### "The Australasian Coachbuilder & Wheelwright."

A Monthly Illustrated Technical Journal circulating amongst Coachbuilders, Wheelwrights and Blacksmiths throughout the Commonwealth of Australia, New Zealand and South Africa.

Advertising and subscription rates on application to

**J. E. BISHOP & CO.,**

65 MARKET STREET,  
Sydney, Australia.

### New Era Electric BLOWER

Direct connected, has been designed especially for the blacksmith and it is his ever ready helper that works for less than five cents a day, it never tires. It places him on equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.

NEW ERA ELECTRIC CO.,



Write for circular and particulars.

912 W. Lake St. CHICAGO.

### The MARVEL

#### Combined Punch and Shear.



Double lever system makes heavy work easy. Cuts and punches iron flat, round and angle. It will pay you to investigate our machine. Write for full particulars, price.

**BLUM BROS. COMPANY,**  
1195-1199 N. California Av., Chicago, Ill.

### WHY NOT BUY A CHUCK

That will fit the spindle of your drill press, holding drills  $\frac{1}{2}$  to  $\frac{1}{2}$  in. inclusive, with reducer to  $\frac{3}{8}$ . Drills held by this chuck are much cheaper than drills with  $\frac{1}{2}$  in. or  $\frac{3}{4}$  in. shank. Simplest and cheapest chuck on the market.

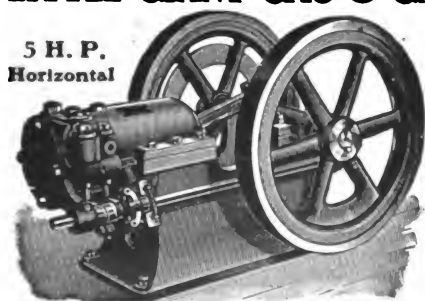
WRITE FOR CATALOGUE AND PRICES



**DETROIT TWIST DRILL CO.**

223 21st Street, Detroit, Mich.

### LITTLE GIANT GAS & GASOLINE ENGINES



5 H. P.  
Horizontal

Sizes, 1½, 3, 4½ H. P. Vertical, 5 to 25 H. P. Horizontal. Either tube igniter or electric igniter. Shipped mounted on skids, if desired for farm use.

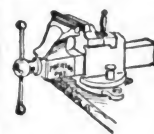


3 H. P.  
Vertical

Also equipped with pumping attachments. Write for booklet describing full line New Era Gas Engines from 8 to 100 H. P. Special inducements to dealers as agents.

**THE NEW ERA GAS ENGINE CO.**

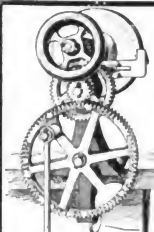
No. 63 Dale Ave., DAYTON, OHIO.



**PRENTISS PATENT VISES**  
ALL STYLES AND SIZES  
FOR ALL USES

LARGEST LINE IN THE WORLD  
ILLUSTRATED CATALOGUE - FREE

**PRENTISS VISE CO.**  
44 BARCLAY ST. NEW YORK.



### BEATS the Grindstone

Hand Power and Foot Power

### Grinders

and Tool Sharpeners

Durable and Fast cutting Alundum Grinding wheels guaranteed

Write for Latest Catalogue Discount to the Trade

**Royal Mfg. Co.**

212 E. Walnut St.

Lancaster, Pa.



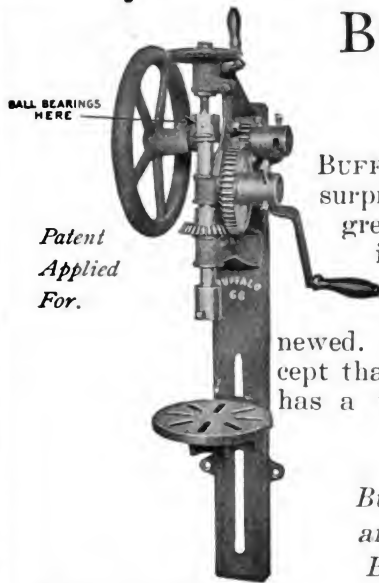
### This Disc Grinder is a Winner

Every blacksmith with power should have one. It is designed to sharpen all sizes and styles of discs. By removing roller clamp you can sharpen axes, hoes, shovels, plow points, plow sweeps, cold chisels, lathe tools, etc. Especially advantageous for sharpening or grinding the edges of concavo-convex discs and it is so constructed that the disc can be securely held at any desired angle and fed to a grinding wheel. The disc holder rotates during the grinding operation and by the use of a novel arrangement of gears both the disc holder and the grinding wheel can be operated from one shaft. A roller clamp is used for holding the edge of the disc upon the grinding wheel and a smooth and uniform edge is thus produced upon the disc.

Write for Particulars  
**SHIPP & DICKERSON,**  
Renner, Texas.

## Buffalo Ball Bearing Drills

### 1906 PATTERNS



Buffalo No. 66 Ball Bearing Drill.

BUFFALO Nos. 66 and 68 are Ball Bearing Drills of surprising strength and capacity. They operate with greatest ease which is due to the splendid bearing construction. Wear is reduced to the greatest minimum possible. No brass connection nuts or soft metal bearings to be renewed. Both Drills are identical in construction except that No. 66 has an iron back and No. 68 has a wood back.

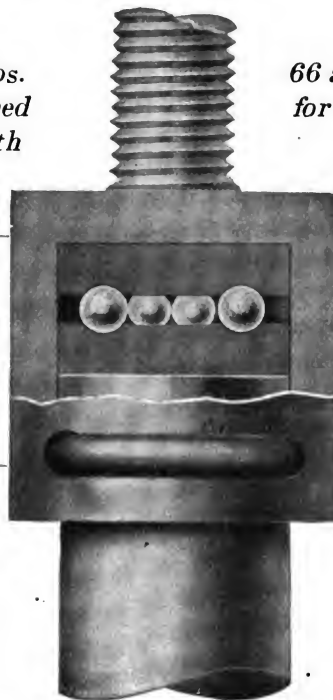


Buffalo No. 68 Ball Bearing Drill.

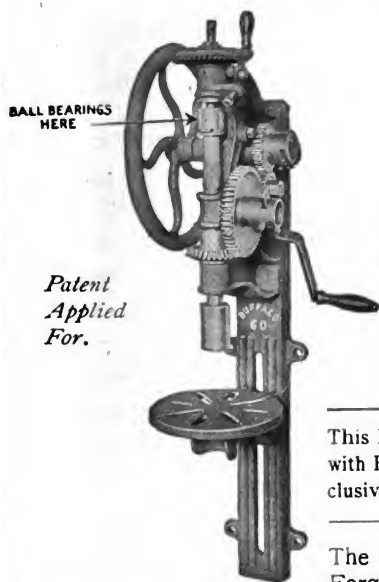
*Buffalo Nos. are designed Blacksmith*

*66 and 68 Drills for light general Work.*

This is an enlarged sectional view of Ball Bearing connection, with Ball Case, Disconnecting Key and Bearings. Used exclusively on Buffalo Nos. 60, 66 and 68 Drills.



The Ball Bearings are placed at the point of greatest friction, where the rapidly revolving Drill Spindle is connected to the Feed Screw, thereby reducing wear to the greatest minimum possible.



Buffalo No. 60 Ball Bearing Drill.

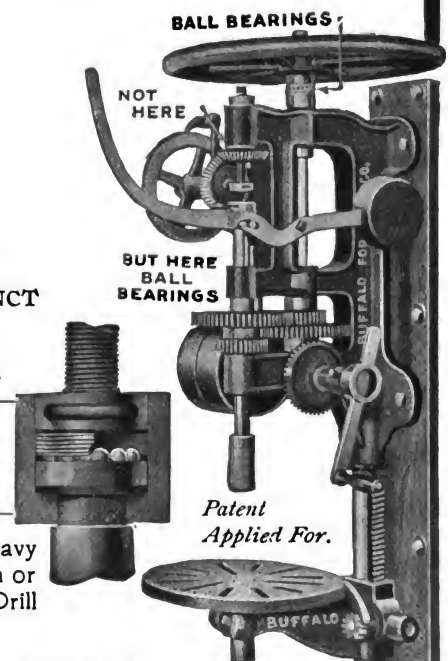
## BUFFALO 90 DRILL

LEVER FEED WITH THREE DISTINCT — FEATURES —

ARRANGED FOR POWER CONNECTION.

This Ball Bearing Cut shows the enlarged end of Feed Screw with Ball Case, Disconnecting Key and Bearings. Used exclusively on Buffalo 90 Drill.

The Lever Feed on Buffalo 90 Drill is made of Heavy Forged Steel. It can be instantly placed in position or removed at will. This Lever Feed is separate from Drill and complete in itself.



Buffalo No. 90 Ball Bearing Drill.

## BUFFALO 60 BALL BEARING DRILL.

This is a Hand Drill of enormous capacity. Designed for Heavy Blacksmithing. Well and Durably Constructed. Is equipped with the same excellent Ball Bearing Connection as Buffalo Nos. 66 and 68, but Drill is of considerably larger capacity than either of these.

SEND FOR ILLUSTRATED CATALOGUE OF OUR EXTENSIVE LINE.  
Buffalo Forge Co., Buffalo, N. Y., U. S. A.

CANADIAN BUFFALO FORGE CO., LTD., MONTREAL.

# A GOOD INVESTMENT

Did you ever run up against a job you didn't know how to do? Then's the time you wish for some good books. The books listed below are written by well known authorities and are filled with good, practical, reliable information. Some, or all of them, ought to be in your library. Now is a good time to get them.

It is impossible to make a better investment. Good books on practical subjects written by the most able writers are what we have to offer, and we offer them at such reasonable prices that rather than say every smith can easily afford them, we claim that you cannot afford to be without them. Read over the list below, and judge for yourself.

**Foden's Mechanical Tables** Save figuring, tell at a glance how much stock to use for oval or elliptical hoops of any size, the circumferences of circles, weight of flat, square and round stock, and the weight and strength of ropes and chains. Should be in every progressive smith's hands. Bound very neatly in green cloth. Price, 50 cents.

**The American Steel Worker** This work is the acknowledged authority on the subject of steel working. It is written in a plain, understandable way, and treats of the hardening, tempering and annealing of steel.

*By E. R. Markham*

Over 150 illustrations, 340 pages. Handsomely bound in grey art cloth. Price, \$2.50.

## **Forge Practice**

*By John L. Bacon*

A most valuable treatise upon forge work of all kinds. It is profusely illustrated and contains chapters on welding, upsetting, drawing out, bending, metallurgy and calculation of stock, also tables and formulas. This is the best book of the year. It has over 250 pages and is bound very neatly in red cloth. Price, \$1.50.

## **The Practical Gas Engineer**

*By E. W. Longenecker, M.D.*

A manual of practical gas and gasoline engine knowledge, covering errors to be avoided, and how to erect, run and care for an engine. It is plainly written and tells you all about your engine. Contains over 140 pages and is neatly bound in green cloth. Price, \$1.00.

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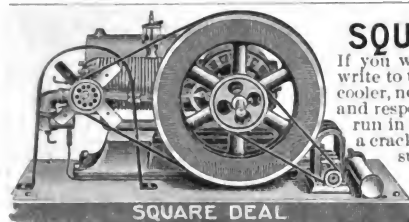
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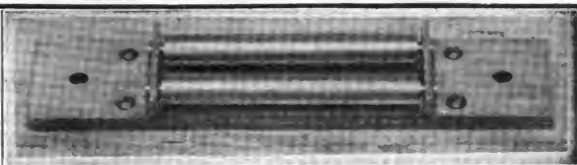
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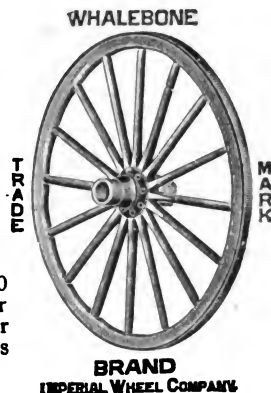


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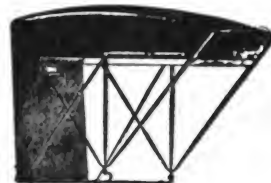
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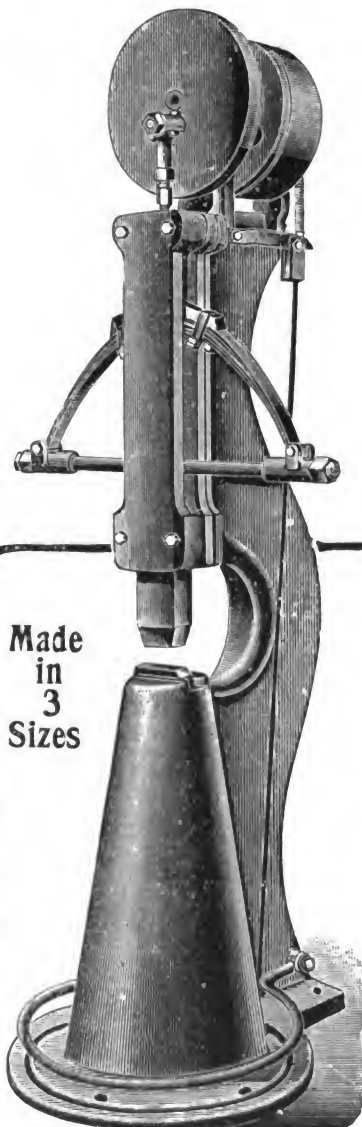
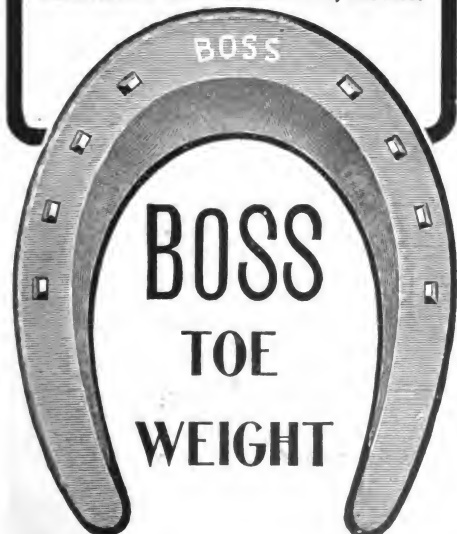
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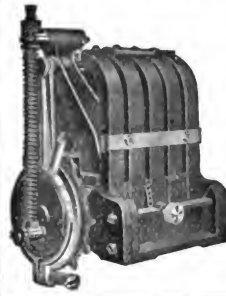
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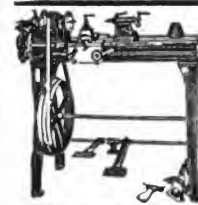
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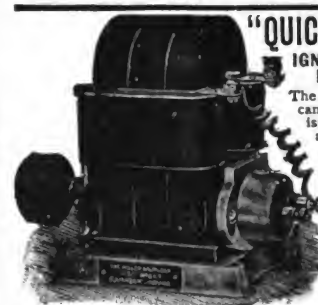
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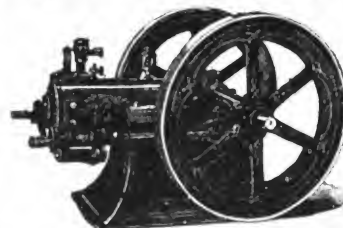
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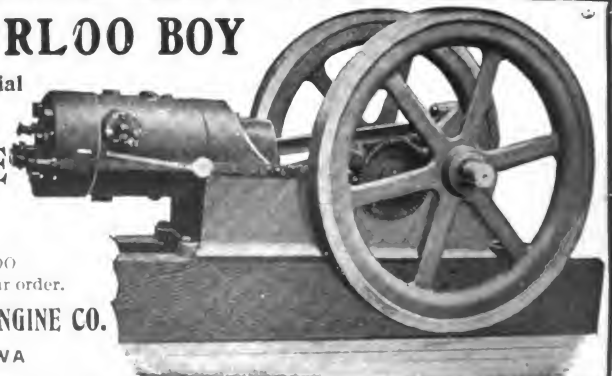
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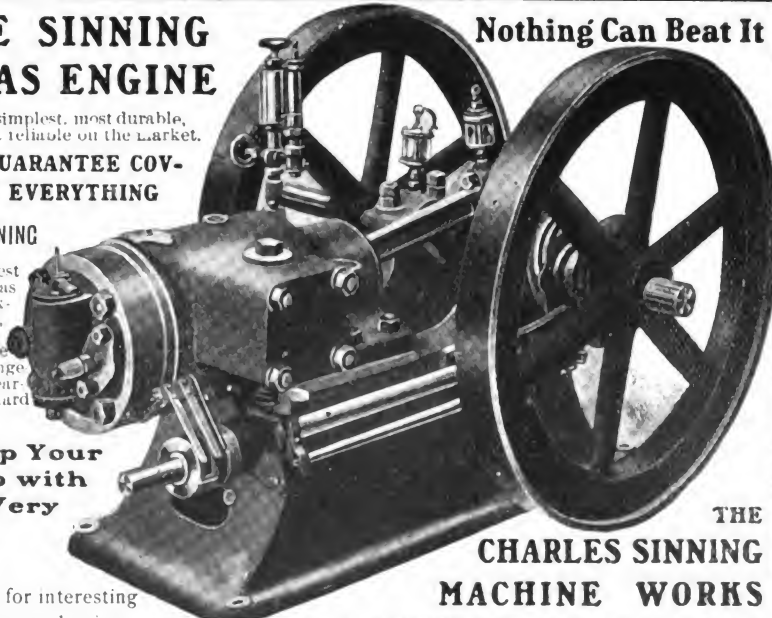
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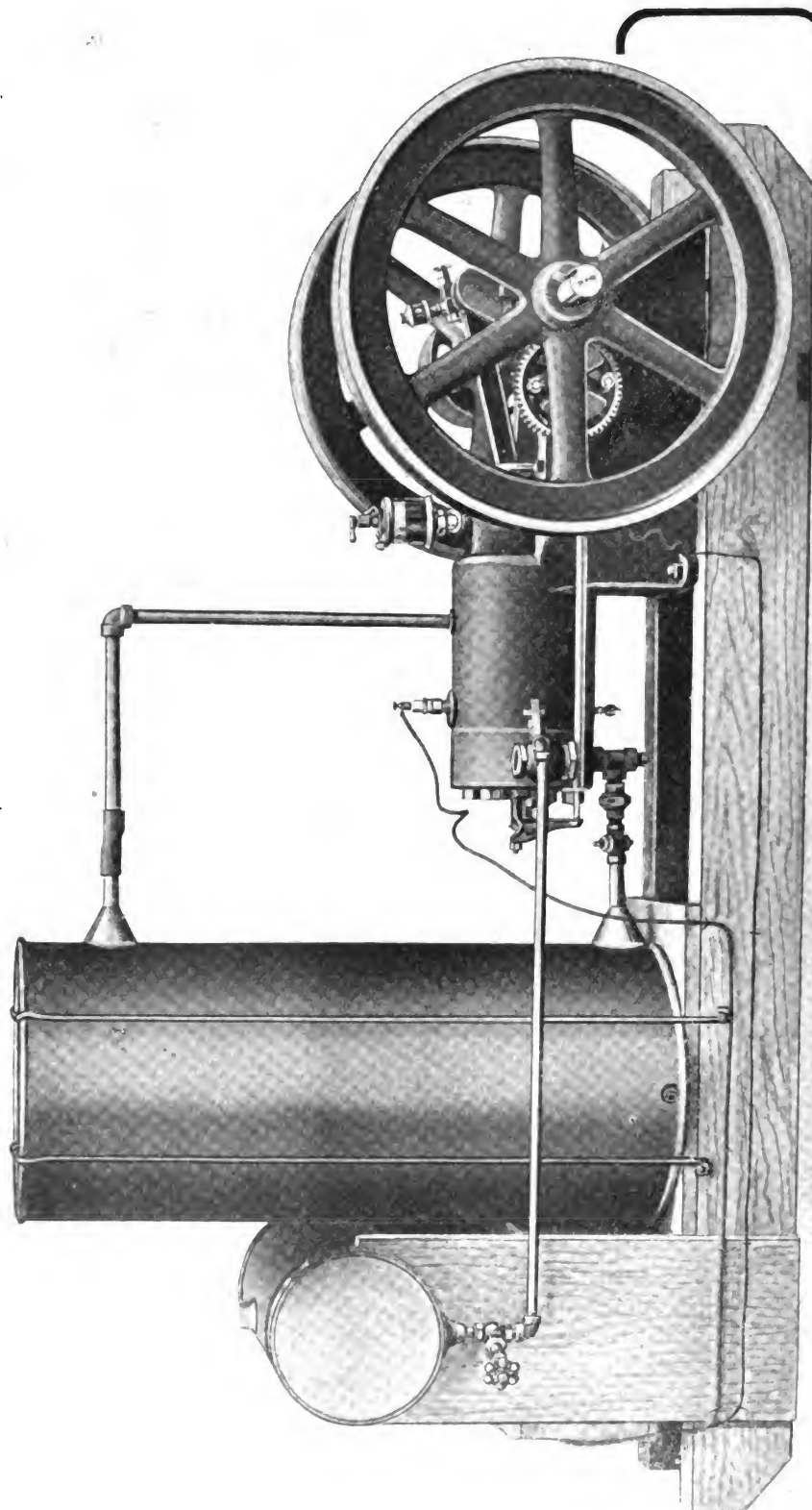


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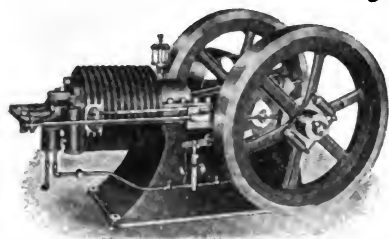
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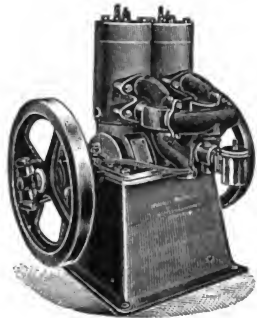
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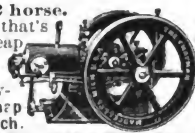
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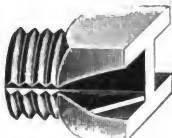
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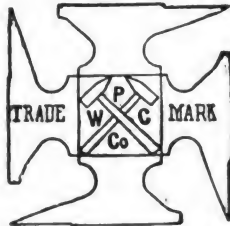
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*To Make a Strong, Clean Weld If You  
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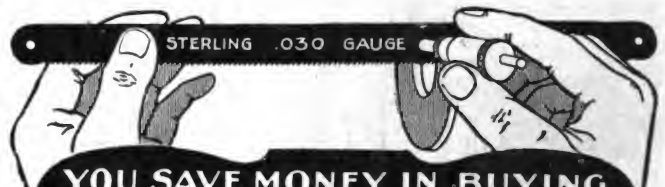
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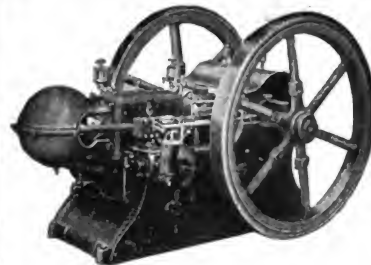
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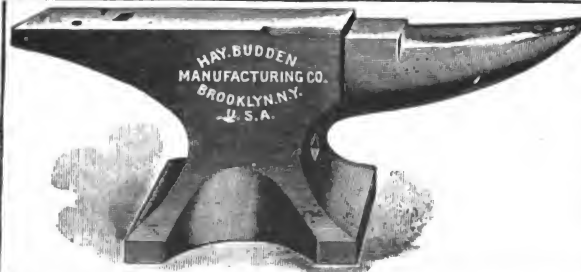
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BUFFALO  
N.Y. U.S.A.

A Practical Journal of Blacksmithing and Wagonmaking

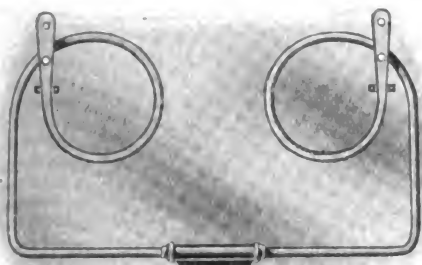
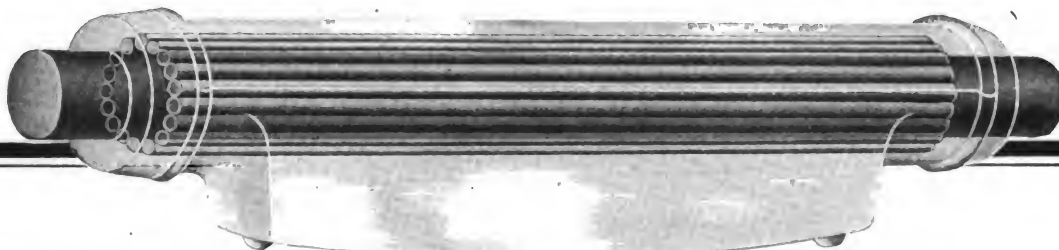
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Equal for Lightness and Style.  
Very Simple to Attach.

We guarantee W. S. Shuler's Patent Roller Bearing Springs  
not to wear or break during life of vehicle and to give  
satisfaction.

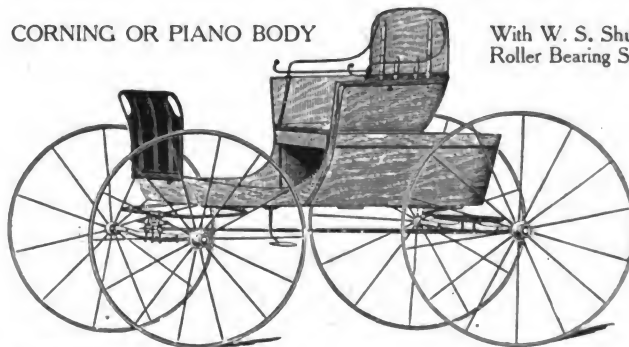
W. S. SHULER SPRING CO.,

Sole Manufacturers.

Amsterdam, N. Y.

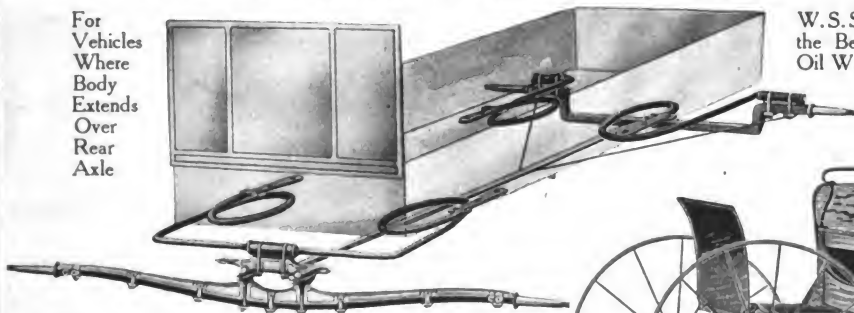
CORNING OR PIANO BODY

With W. S. Shuler's  
Roller Bearing Spring.



Roller Bearing Three Spring

For  
Vehicles  
Where  
Body  
Extends  
Over  
Rear  
Axle



Order a sample Gear in the white, hung with W. S. Shuler's  
Patent Roller Bearing Springs. You will want more.

WRITE US FOR COMPLETE  
FREE CATALOG.

**SCHUBERT BROS. GEAR CO.**  
**ONEIDA, N. Y.**

W. S. Shuler's Patent Roller Bearing Springs are Absolutely  
the Best for Buggies, Runabouts, Surreys, Buckboards,  
Oil Wagons, Sewing Machine Wagons, R. F. D. Mail  
Wagons, Light Business Wagons, Etc.



TWO OR FOUR PASSENGER BUCKBOARD  
EQUIPPED WITH W. S. SHULER'S ROLLER BEARING SPRINGS

# Don't Read This Ad.

IF YOU are one of those who ARE NOT on the alert to save money, time and labor in your smith shop or carriage factory, then *don't read this ad.* We are after the discriminating man, the wise, careful, far-sighted man, the man who believes in the best—the man who wants to save money, time and labor.

The name "*Silver*" is synonymous with "*quality*." When you buy a Silver machine you PAY for quality—and brains. The policy of improvement to which we have steadily adhered has placed us easily in the very first rank. Every machine spells

## Durability, Strength, Accuracy.

Every part of every machine is a strong part and made to perform its work perfectly. We mention a few of them here. Send for booklet for full information.

**BAND SAWS**—neat, new designs, substantial construction, table adjustable to different angles up to 45° for bevel sawing; used for cutting cloth, ice, cardboard, sheet metal, brass, etc.; several sizes.

**DRILLS**—Post, Swing and Bench Drills, hand and power. Every wanted size. New, simple, efficient and positive; for shops and small factories, smith shops, repair shops, iron furnaces, carriage and wagon shops.

**NEW TAPER HUB BORING MACHINES**—centre the hub instantly and accurately; instantly adjusted for taper or straight bore.

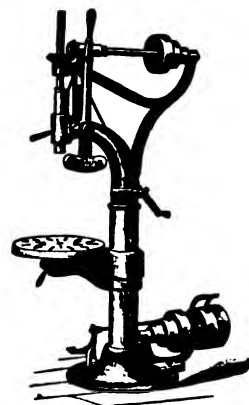
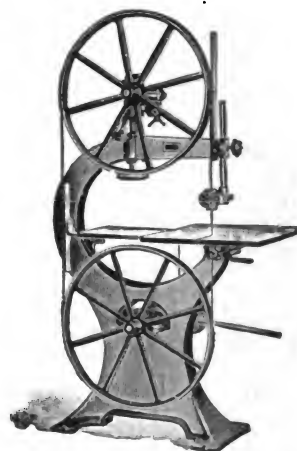
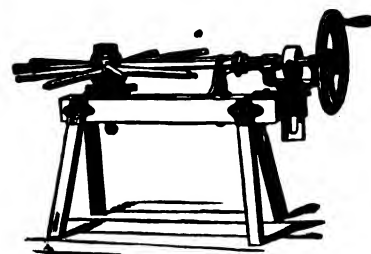
**PORTABLE FORGES**—in all sizes and prices—light-running, convenient, durable and economical—real money savers.

We want to prove the merits of these and our other machines. Ask us for our booklet "*Carriage Maker and Blacksmith Tools*." It's free.



Fig. 925.

SILVER'S PORTABLE FORGE.

Fig. 850.  
SILVER'S  
BASE DRILL.Fig. 822.  
SILVER'S POWER  
BAND SAW.Fig. 718.  
SPOKE TENON MACHINE.

MANUFACTURED BY

# The Silver Mfg. Co.

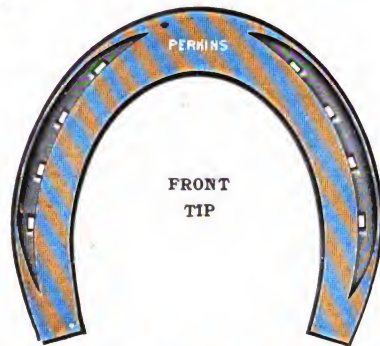
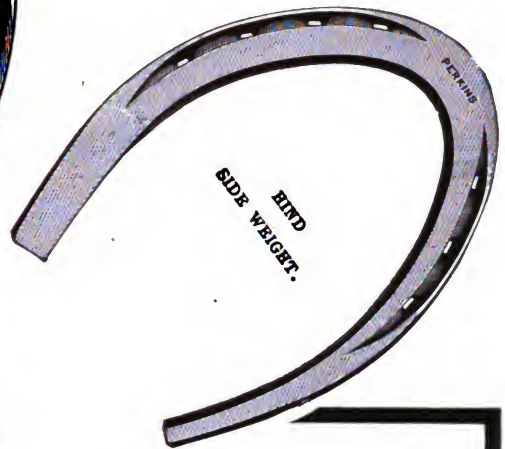
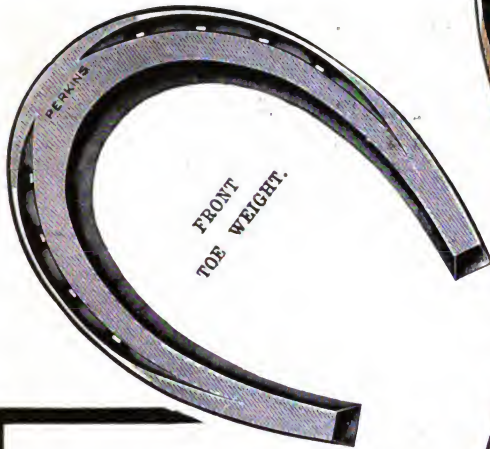
365 BROADWAY,

## Salem, - Ohio.



★**PERKINS**★  
HORSE SHOES  
AND  
TOE CALKS  
THE **STAR** BRAND

★**PERKINS**★  
HORSE SHOES  
AND  
TOE CALKS  
The **SUPERIOR** Kind



**PERKINS**  
**SHOES**

Have more points of superiority than any other make. An up-to-date shoe for up-to-date Blacksmiths.

OUR  
Complete  
Catalogue  
SENT FREE.  
Write Today.

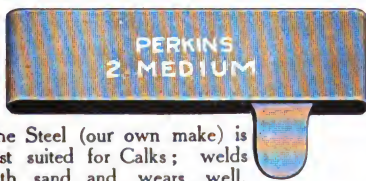
**PERKINS**  
**SHOES**

Are acknowledged by all users to have no equal. Made in all Styles and Sizes. Sold at Reasonable Prices.

Send  
for Samples New  
Pattern Front  
Extra Light and Light.  
Free for asking.

**PERKINS**

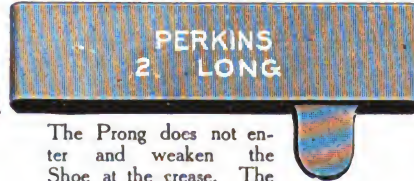
Made in Medium and Long, both blunt and sharp. Packed in 25 lb. boxes.



The Steel (our own make) is best suited for Calks; welds with sand and wears well. Perfectly graded in Length and Size.

**TOE CALKS**

Chisel Pointed Prong. These cuts show exact size of No. 2. SAMPLES SENT FREE.

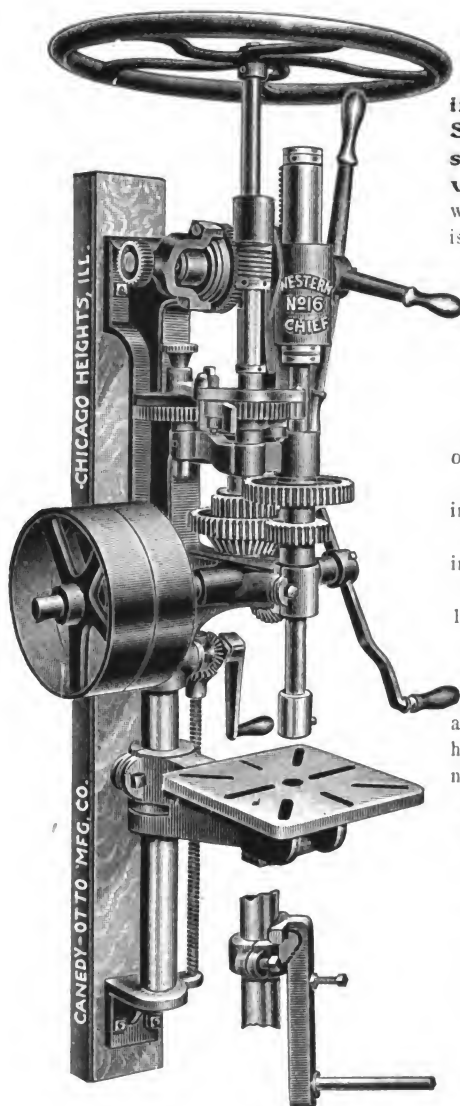


The Prong does not enter and weaken the Shoe at the crease. The only slightly curved Calk sold.

MANUFACTURED BY

**RHODE ISLAND PERKINS HORSE SHOE COMPANY**  
**PROVIDENCE, RHODE ISLAND.**

# No. 16 = Western Chief Drills = No. 17



## DESCRIPTION

Hand Lever Feed, also Horizontal, Gear Driven Positive Self Feed, changeable instantly to fast, slow or medium speed as desired. These feeds work independent of each other and bit is lifted quickly.

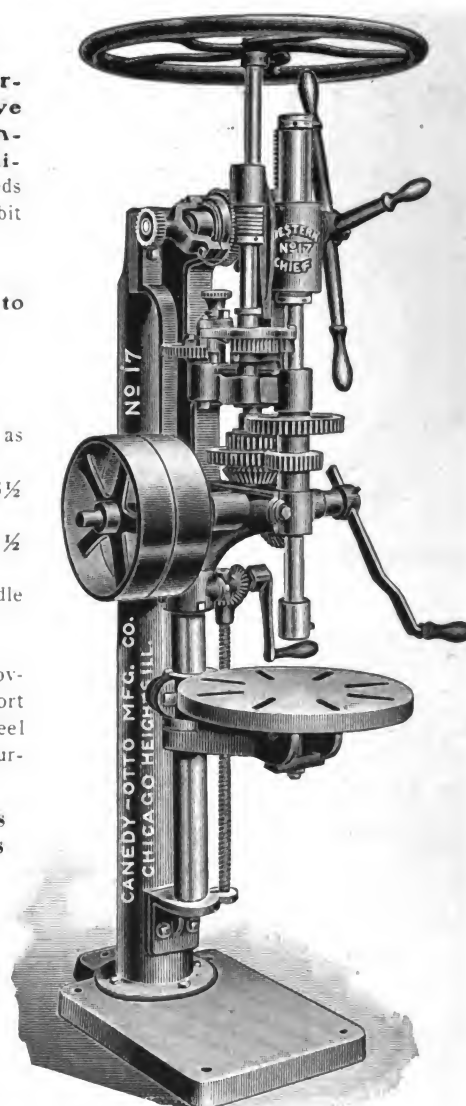
### Cut Gears.

Raise and lower device to table

Drills to center of 24-inch circle.  
Bores from 0 to 1½ inch.  
Takes Bits ½ or 41-64 Shank as ordered.  
Spindle has up and down run of 8½ inches.  
Table has up and down run of 15½ inches.  
Greatest distance from table to spindle 18½ inches.

Wheel rims can be drilled by removing table and using the forked support as a wheel holder. A special wheel holder attachment as illustrated is furnished when desired.

No. 16, Weight 360 pounds  
No. 17, Weight 560 pounds



## Royal Blower

"The Successful Blower"

Gear case is oil-tight and dust-proof. Gears run in a continuous bath of oil. No spiral gears, worm gears or ball-bearings. Crank turns forward or backward. Fan 12 inches. Weight 135 pounds.

Fire pot is 8x9 1-2x4 inches inside.  
Needs no Clay.



Some  
"Popular Tools"

Made by

**CANEDY - OTTO  
MFG. COMPANY,**

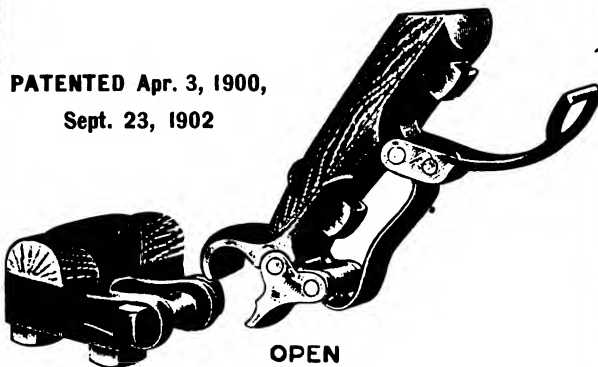
Chicago Heights, Ill.

FOR SALE BY  
First-Class Dealers  
EVERYWHERE.



# THE HOLD FAST COUPLER

PATENTED Apr. 3, 1900,  
Sept. 23, 1902



OPEN

All Steel All Right All the Time

Fits any bolt or lug from  $\frac{7}{8}$  to  $\frac{3}{4}$  inches in diameter. No Bushings of any kind required. Takes up its own wear. One hand, the only tool required to operate it. Quick as a Wink. Silent as the Grave. Drop forged from bar STEEL. Crucible STEEL Spring, every one right. Workmanship the BEST. Nothing cheap about it but the Price. STEEL'S the stuff, no Malleable Iron in the Holdfast. Made "a little better than seems necessary." We can furnish the Holdfast with Weldless long length shaft irons 28 to 34 inches long, and with 8-inch "T" pieces for cross-bar. Irons are  $\frac{5}{8}$  by  $1\frac{1}{8}$  inches in cross section, with quarter round edge. The Holdfast has the well-known BRADLEY quality, the ALL RIGHT brand. If you are interested, write for prices or order a sample pair.

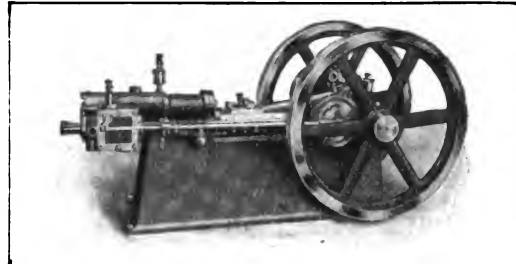
**C. C. Bradley & Son**  
SYRACUSE, NEW YORK

## BLACKSMITHS AND WHEELWRIGHTS

Who are going to buy an engine should buy the **BEST**, because you have no time to waste. Buy an engine that is designed for work, with all the latest improvements. The name is the

**ROBERTSON STRAIGHT LINE  
GAS OR GASOLINE ENGINE.**

Interesting circulars sent free.



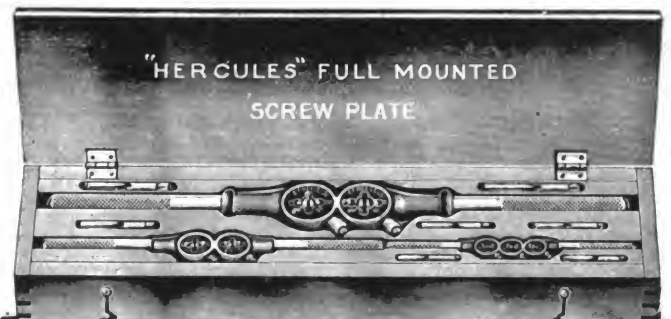
Made from 4 to 40 H.P.

These engines are run on any grade gasoline or natural or artificial gas at a few cents per day. No coal or dirt.

Note you have no batteries, coils, magnetos, hot tubes, etc., to give you trouble. They are simply perfection and our agents offer is open in some territory. Write at once, today.

**Robertson Mfg. Co., Buffalo, N. Y.**

## REECE HERCULES FULL MOUNTED SCREW PLATES



WONDERFULLY STRONG FULLY GUARANTEED  
**A NEW UP-TO-DATE LINE**

Hercules Screw Plates have many strong points that are appreciated by the skilled mechanic. There is no changing of dies because a stock is furnished for every die and dies are always ready for instant use. Double stocks, a new idea of ours. All our stocks have Knurled Handles. The dies and taps in Hercules Screw Plates are the Celebrated Reece kind, fully guaranteed and the freest and most accurate cutting tools made. Hercules Screw Plates are not only the finest in quality, but the lowest in price as well and that's the kind you're looking for. The big demand for our goods enables us to sell at a small profit. The prices we can quote you on first-class screw plates will surprise you. **WRITE TODAY** for our Illustrated Catalogue and Price Lists. Free to you.

**THE E. F. REECE CO.,**  
SOLE MANUFACTURERS  
GREENFIELD MASS., U. S. A.



"Let the  
Kerrihard  
Hammer  
do Your  
Work."

### The Right Tool at the Right Price

There is a rigid test and a thorough inspection of every part and feature of the Kerrihard Hammer, whereby every possible weak spot is found in the factory and not in your shop.

This practice covers every step from the design and selection of the raw material to the finished product and begets a hammer that is right and stays right.

In it is embodied every modern feature that has proven worthy of adoption and our facilities enables us to present a hammer at a price far below anything approaching it in quality.

An origin, a record and an appearance which sells it almost on sight, a consistent "making good" of every promise quadrupled our sales over last year. We wouldn't mind telling you here just how many we sold only you'd think we were joking. If you want to know what a Kerrihard hammer will cost you, address

**THE KERRIHARD CO.,**

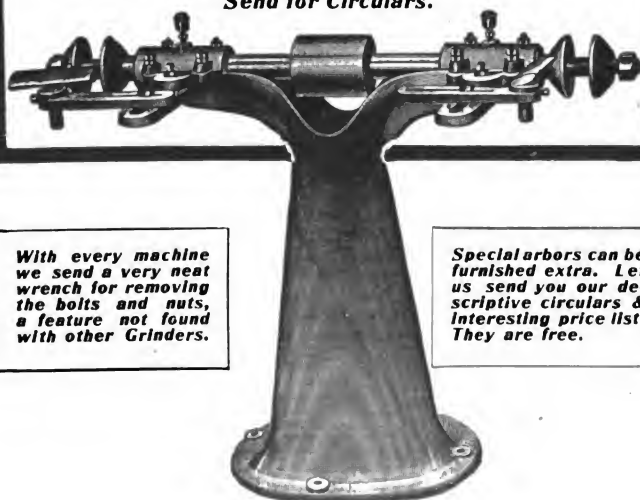
HAMMER AND GRINDER DEPT.,

RED OAK, IOWA, U. S. A.

### OUR NEW EMERY GRINDER

is Especially designed for the Blacksmith Trade. Will Carry Wheels 20 in. in diam., 3 in. thick or smaller with  $1\frac{1}{4}$  hole. Price most Reasonable.

Send for Circulars.



With every machine we send a very neat wrench for removing the bolts and nuts, a feature not found with other Grinders.

Special arbors can be furnished extra. Let us send you our descriptive circulars & interesting price list. They are free.

## MORGAN & WRIGHT TIRES AND PADS HAVE WON THE CONFIDENCE AND INCREASED THE BANK ACCOUNTS OF SHOERS.

The reason why

### MORGAN & WRIGHT PADS

have made such a decided hit with wide-awake shoers is due almost wholly to this fact:

*They have educated hundreds of horse-owners to the pad-using idea by proving to them that GOOD pads are a big help in keeping a horse in WORKING condition. More than this, these pads give the horse-owner LONGER SERVICE FOR HIS MONEY than do other brands, thus helping the shoer to build up a BIG business.*

Ask any shoer who has tried them as to whether they help the pad business.

They are made of exceptionally tough stock; are scientifically correct in shape; run longer than do other brands; are decidedly easy to fit; and **cost no more than other kinds.**

Try them. They'll help you get the pad business of your town.

Any jobber can supply you.

**MORGAN & WRIGHT PADS  
ARE GOOD PADS**

**You can find shoers everywhere who are handling Morgan & Wright goods EXCLUSIVELY, simply because they have PROVEN that it always PAYS to do so.**

**MORGAN & WRIGHT,  
CHICAGO.**

New York Dayton Detroit Atlanta St. Louis  
San Francisco



# ECCLES BALL-BEARING COUPLINGS

## WITH LEATHER BUSHINGS

We make these Couplings in Buggy and Surrey sizes, and with Extension for Welding on an Axle Step.

Note how the Spring is fastened at the front end by a pivot, so that it can be TURNED FORWARD out of the way, while clipping the Coupling on the Axle.



PATENTED NOV. 25, 1902.

We make Wide Center Clips, both 5-16 and 3-8, and Square Clips for use with these Couplings, also Solid Forged Step Shank Clips.

The ease with which our Couplings are put on will save you money.

WE ARE MANUFACTURERS OF A FULL LINE OF  
**CARRIAGE AND WAGON FORGINGS**

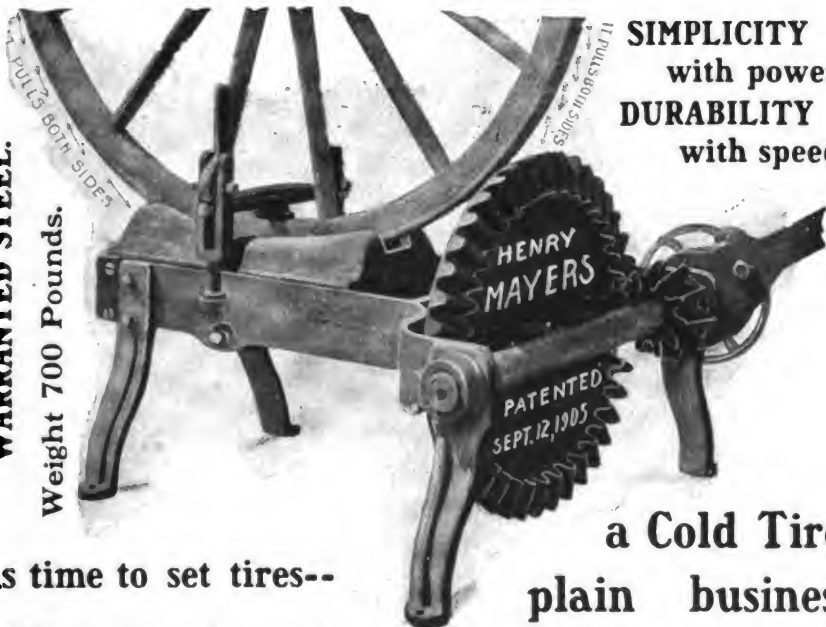
**RICHARD ECCLES CO.**

**Auburn, N. Y.**

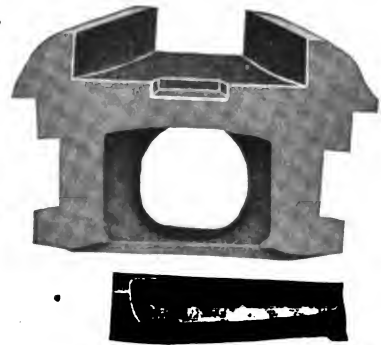
# MAYERS COLD TIRE SETTING MACHINE.

EVERY OUNCE, PIECE and PART  
WARRANTED STEEL.

Weight 700 Pounds.



SIMPLICITY  
with power  
DURABILITY  
with speed



It is time to set tires--  
Talking time is past.

If you really want  
a Cold Tire Setter, we have a  
plain business proposition to  
make you.

**HENRY MAYERS MACHINERY CO.**

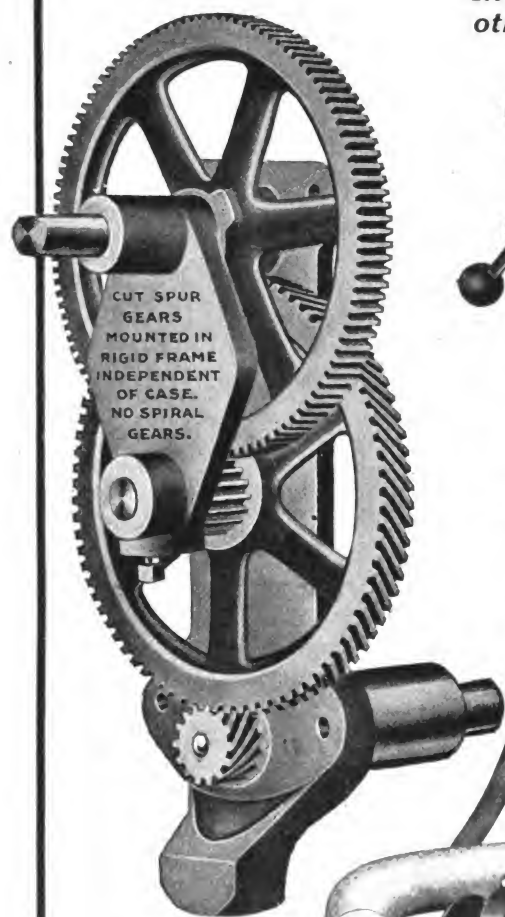
1721-23 North Eighth St.

ST. LOUIS, MO.

# Buffalo 200 Blower

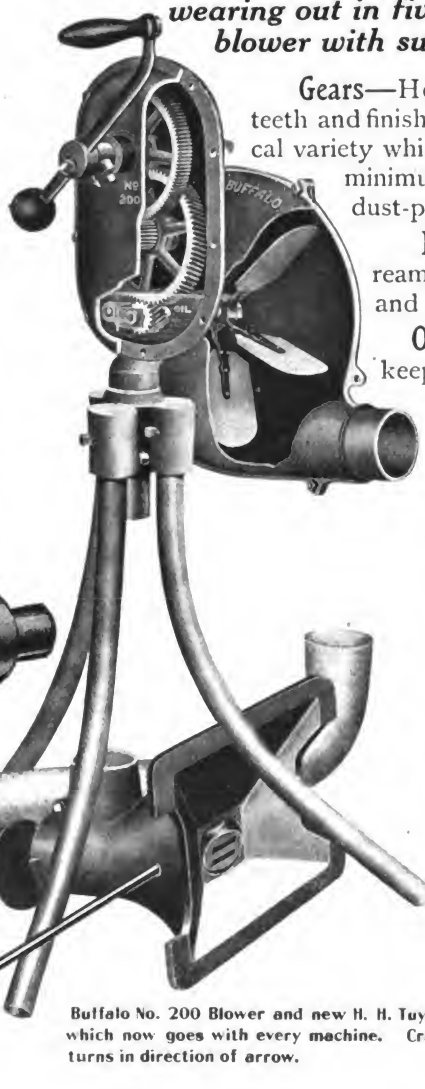
## Our Gilt Edge Guarantee

*In this Blower we offer you the guarantees given with all other blowers in the world. In addition we will replace, free of charge, any parts of Buffalo No. 200 Blower wearing out in five years. Can you buy any other blower with such a guarantee?*



Gearing Used on Buffalo Nos. 200 and 201 Blowers.

Canadian friends: Save duty, buy of The Canadian Buffalo Forge Company, Montreal, Quebec.



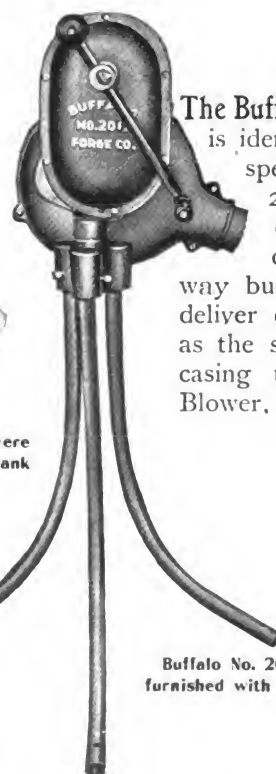
Buffalo No. 200 Blower and new H. H. Tuyere which now goes with every machine. Crank turns in direction of arrow.

**Gears**—Heavy, with large, strong, machine-cut teeth and finished on special machinery, cut spur and helical variety which reduces friction to the greatest possible minimum. Gears are enclosed in a cast-iron, dust-proof casing.

**Bearings**—Bored from solid castings and reamed to gauge, ensuring perfect alignment and smooth easy running.

**Oiling**—Gears run in oil which constantly keeps the working parts perfectly lubricated.

**Blast**—We positively guarantee the Buffalo No. 200 Blower to produce a stronger, more powerful blast, with the same number of turns of crank, and with less effort, than any other blower in the world.



Buffalo No. 201 Blower furnished with H. H. Tuyere.

The Buffalo No. 201 Blower is identical in every respect with the No. 200 except the form of fan casing. The crank turns either way but blower does not deliver quite as much air as the standard scroll fan casing used on No. 200 Blower.

YOUR DEALER will place a BUFFALO NO. 200 BLOWER in your shop for free trial to demonstrate its superior qualities.

*Copy of our Latest illustrated Catalogue sent on request.*

# BUFFALO FORGE COMPANY,

BUFFALO, N. Y., U. S. A.





**Reinforced**  
**DIAMOND**  
**Welds**

PATENT APPLIED FOR

USED ON ALL OUR POLES AND SHAFTS.

**THE PIONEER POLE & SHAFT CO.**  
**PIQUA, OHIO.**

SEND FOR POLE AND SHAFT CATALOGUE AND PRICES.

F. C. HARRIS & CO. CH. O.

## WOLFE'S COLD TIRE SETTER

A MONEY MAKER FOR THE BLACKSMITH.

THE BEST MACHINE ON THE MARKET  
 FOR SETTING AND RE-SETTING TIRES  
 COLD.

The desirable points in a cold tire setter are strength, endurance, quick adjustments and economy of space. Wolfe's Cold Tire Setter combines these to a remarkable degree. It occupies 2 ft. x 3 ft. floor space. It is made entirely of best open-hearth steel; it is neat in appearance, and will last a life-time.

GIVES SATISFACTION TO EVERY  
 PURCHASER.

Edward Black, Bendersville, Pa.—"The Wolfe Cold Tire Setter bought of you is the machine to set tires quick and right. Does better work than any other machine I know of, and beats the old way of setting tires, three to one. It is just what every blacksmith needs."

INCREASE YOUR TRADE.

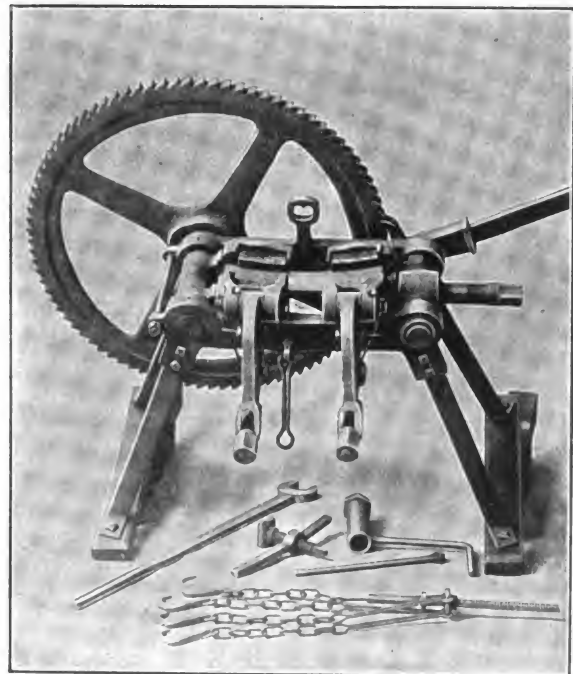
By buying one of these Up-to-date Modern Machines. It means quick, efficient service to your customers. You can set their tires "while they wait." Saves time, labor, means more trade and more money for the smith.

Interesting descriptive circulars SENT FREE.

Write today—a postal will do.

MANUFACTURED BY

**THE G. M. YOST COMPANY, Waynesboro, Pa.**



CORRUGATED PATTERN.

**Capewell Horse Nails Possess those Qualities "Necessary to Make  
a First-Class Nail, Namely, Uniform Size, Toughness, with  
Stiffness Enough to Drive into the Hardest Hoof."**

RECORD SHOEING SHOP.

RENO, NEVADA, February 3, 1905.

THE CAPEWELL HORSE NAIL CO.,

*Gentlemen:—*

I have used in my thirty years at this business every make of horse nails, from the old hand-made nail right up the line until I came to the Capewell, and found in them what was necessary to make a strictly first-class nail, namely, uniform size, toughness, with stiffness enough to drive in the hardest hoof.

With the Capewell nail we can use one size smaller nail than with any other and know they are going to stay and do the work.

I have used Capewell nails ever since they were introduced on the Coast. Have shod some of the best horses in California before I came here in July, and will say I have never lost a single shoe that was put on with a Capewell nail. Give me the Capewell first, last and all the time and I will never have a customer complain of losing a shoe, unless he loses the foot with it.

Yours truly,

GEO. C. BREWEN.

**Accurate Mechanical Tests have Demonstrated that  
the Tensile Strength of Capewell Nails is One-  
Half Greater than that of any other nails made.**

Made by **The Capewell Horse Nail Company**  
**HARTFORD, CONN.**

The Largest Manufacturers of Horse Shoe Nails in the World.

## BRANCHES

New York: . . . 103 Beekman St.  
Philadelphia: . . . 323 Arch St.  
Baltimore: . . . 6 East German St.  
Buffalo: . . . 11 Ellicott St.  
Cincinnati: . . . 720 Main St.  
Detroit: . . . 29-31 Farrar St.  
Mexico City: . . . Apartado, 2377

Chicago: . . . 238-240 Randolph St.  
St. Louis: . . . 12-14 North 12th St.  
New Orleans: . . . 736 Union St.  
Denver: . . . 1611 Blake St.  
San Francisco: *Santa Fe Warehouse, Spear St.*  
Portland: . . . 554 Worcester Block.  
Toronto, Canada: . . . 50-56 Duke St.

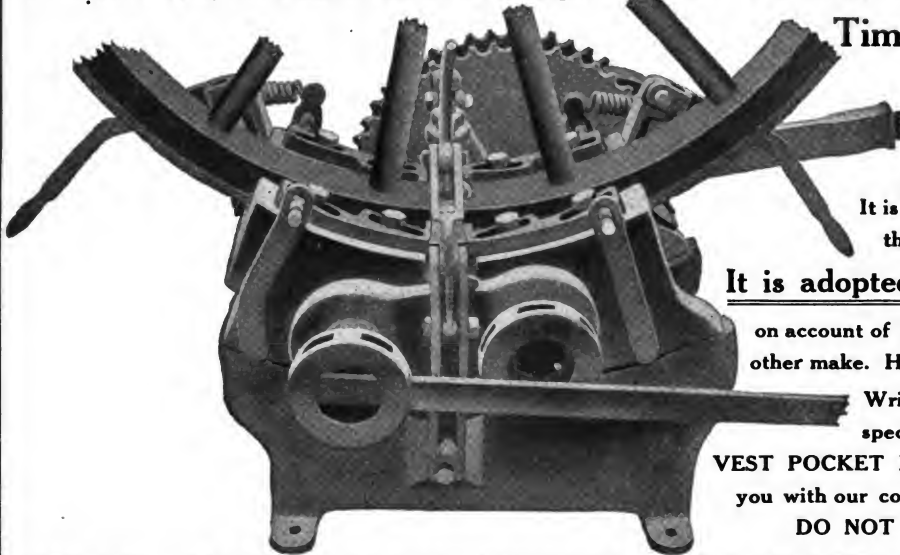
Catalogue Free upon Application.

PLATE PATTERN.



# YOU ARE THE MAN

Who would be setting the hundreds of tires that others are setting in your locality every year, if you had a **BROOKS**. It gets the business. It sets all sizes of tires by compressing the metal cold. It does the work in from two to five minutes. It is the only machine that has an automatic device for gripping the tires so that the keys will not slip. The **BROOKS** is the easiest operated, the strongest in construction, the most durable and compact Cold Tire Setter built.



## Time and Experience Must Precede Perfection

The **BROOKS** is built by the oldest manufacturers of edge grip machines. It is the superior of all others and receives the highest awards wherever shown.

### It is adopted by the Government Shops

on account of its demonstrated superiority over every other make. Has no equal for rapid and accurate work.

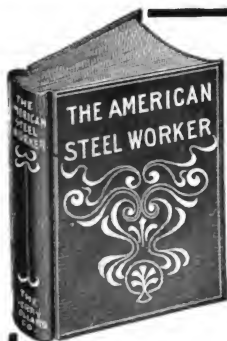
Write us for **DESCRIPTIVE BOOKLET**, special terms and free trial, and a handy **VEST POCKET MEMORANDUM BOOK** will be sent you with our compliments.

**DO NOT DELAY—WRITE TODAY.**

## THE BROOKS TIRE MACHINE COMPANY

121 North Water Street,

WICHITA, KANSAS.



## "BEST BOOK I EVER SAW"

Writes a blacksmith. Lots of others say so, too. Markham has been hardening steel for 27 years and studying it all the time. He tells in plain English just how to handle each case. Shows the best methods; but if you can't get them, it tells you how to do good work with what you have.

You can build a first-class furnace if you want to from his plans and use any fuel you like.

Don't think you've got this information in other books—you haven't. It isn't there. Other books may read nicely and sound well, but none of the authors has had Markham's experience, and that's what counts.

343 pages, \$2.50.

Money back if not satisfied, or sent on approval.

AMERICAN BLACKSMITH COMPANY,  
P. O. Drawer 974. BUFFALO, N. Y.

# Little Giant

COMBINED

## Punch and Shear.

The Most Powerful Lever Punch and Shear Made.

5 Punches and Dies with Each Machine.

MADE IN THREE SIZES.

No. 1—Will punch  $\frac{3}{8}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{3}{8}$ -inch thick and 1-inch round. Weight, 515 lbs.

No. 2—Will punch  $\frac{1}{2}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{1}{2}$ -inch thick and  $\frac{7}{8}$ -inch round. Weight, 350 lbs.

No. 3—Will punch  $\frac{3}{4}$ -inch hole in  $\frac{3}{4}$ -inch iron. Cuts iron  $\frac{3}{4}$ -inch thick and  $\frac{3}{4}$ -inch round. Weight, 280 lbs.

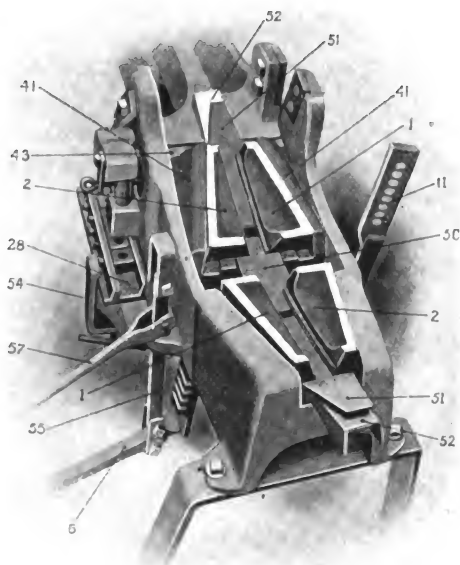
Only ONE operation of the Lever does the work. No changing required.

Note the improved Stripper and Hold-down. This machine is made for the blacksmith shop, and we DO claim that it is decidedly the best on the market for that place.

For Sale by your Jobber. If not, Write Us. Send for Circular.

Little Giant Punch & Shear Co., Sparta, Ill.





## THE IMPROVED HOUSE COLD TIRE SETTER

Our No. 2 improved machine has both hand and power attachments and easily sets all ordinary tires up to 1 by 4½ inches, and shears 1 by 5 flat iron, 1¾ round, and cuts off axles up to 1½ square and will punch all size holes up to ¾ in.

By using the tire setter frame for shear and punch we produce same with little additional cost, and we therefore make each customer a present of a shear and punch worth at least \$80.00.

We have thousands of our machines in use and none of them are broken up, or worn out or abandoned. They cost nothing to keep in repair, and they do the work right. The heads move with the circle of the wheel, pulling the tire from both ways evenly, not injuring the felloes as the so-called Tire Setters do, where the heads move back and forth on a straight line; for instance, when their heads are apart to receive the wheel, the tallest one will fit down in them, but when closed as in shrinking, the curve in the heads just fits an ordinary wheel. You know the consequence if you close in the circle of a portion of a tall wheel to the circle of a small one.

Don't let them deceive you.

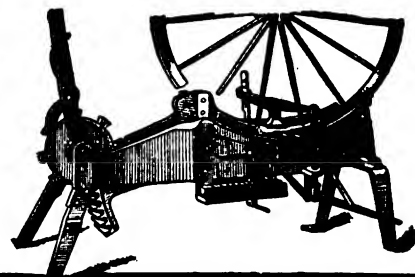
We have the only successful grip-keys and the only successful way for adjusting the same, both of which are patented. Others who claim to have our grip-keys are only using what we have thrown away.

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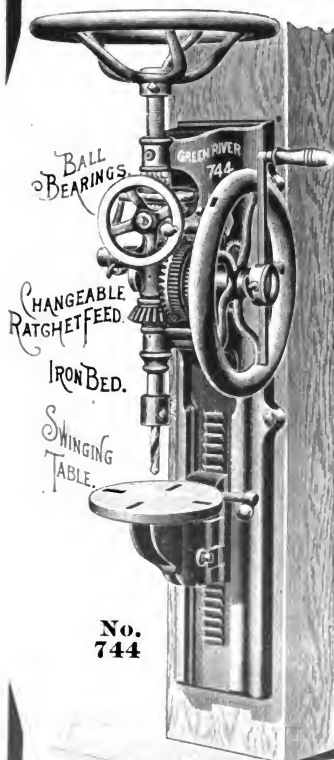
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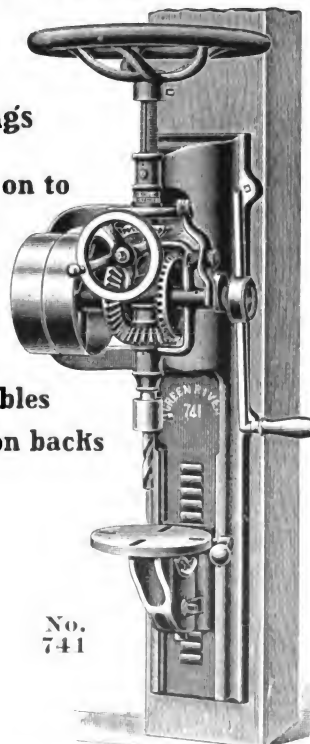
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**Spindles are  
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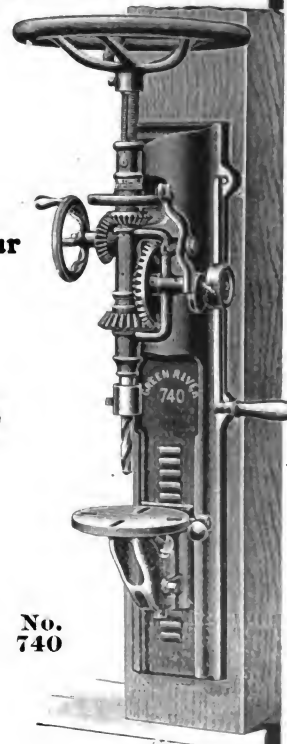


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### The Perfect Power Hammer

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will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



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A GOOD  
BLOWER  
THAT  
BLOWS  
EVERY  
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MODERN MACHINERY  
MAKES THE SMITH'S  
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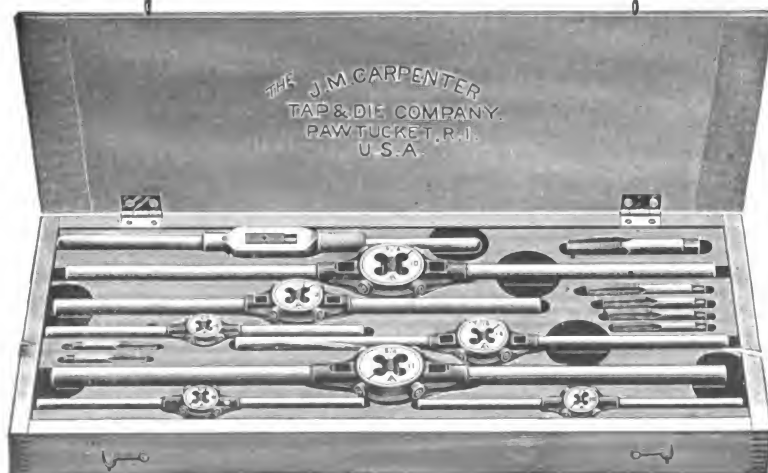
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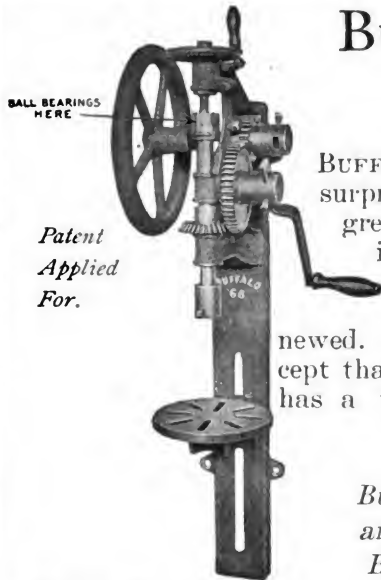
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## Buffalo Ball Bearing Drills 1906 PATTERNS

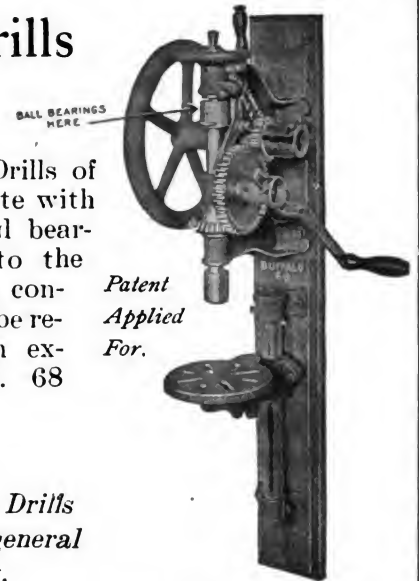


Buffalo No. 66 Ball Bearing Drill.

BUFFALO Nos. 66 and 68 are Ball Bearing Drills of surprising strength and capacity. They operate with greatest ease which is due to the splendid bearing construction. Wear is reduced to the greatest minimum possible. No brass connection nuts or soft metal bearings to be renewed. Both Drills are identical in construction except that No. 66 has an iron back and No. 68 has a wood back.

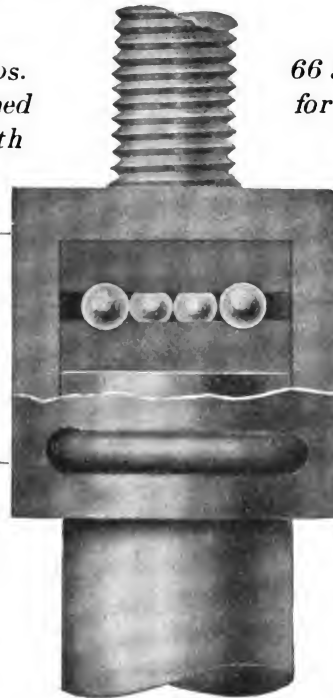
*Buffalo Nos. are designed Blacksmith*

*66 and 68 Drills for light general Work.*

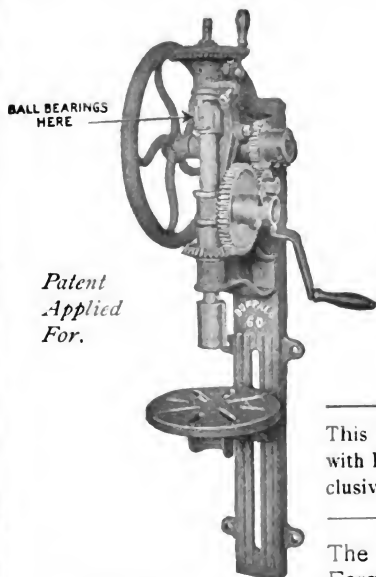


Buffalo No. 68 Ball Bearing Drill.

This is an enlarged sectional view of Ball Bearing connection, with Ball Case, Disconnecting Key and Bearings. Used exclusively on Buffalo Nos. 60, 66 and 68 Drills.



The Ball Bearings are placed at the point of greatest friction, where the rapidly revolving Drill Spindle is connected to the Feed Screw, thereby reducing wear to the greatest minimum possible.



Buffalo No. 60 Ball Bearing Drill.

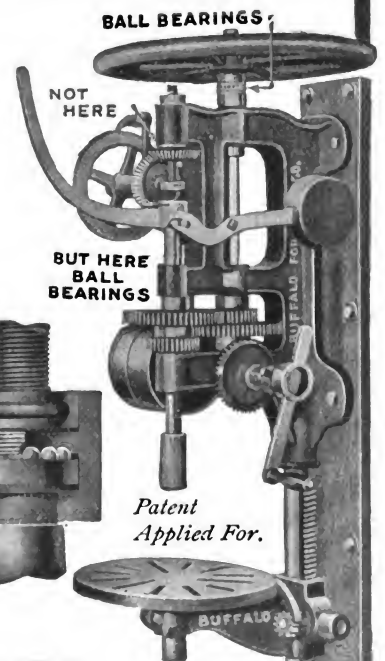
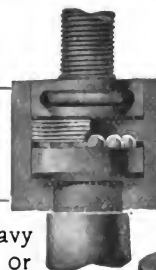
## BUFFALO 90 DRILL

LEVER FEED WITH THREE DISTINCT — FEATURES —

ARRANGED FOR POWER CONNECTION.

This Ball Bearing Cut shows the enlarged end of Feed Screw with Ball Case, Disconnecting Key and Bearings. Used exclusively on Buffalo 90 Drill.

The Lever Feed on Buffalo 90 Drill is made of Heavy Forged Steel. It can be instantly placed in position or removed at will. This Lever Feed is separate from Drill and complete in itself.



Buffalo No. 90 Ball Bearing Drill.

## BUFFALO 60 BALL BEARING DRILL.

This is a Hand Drill of enormous capacity. Designed for Heavy Blacksmithing. Well and Durably Constructed. Is equipped with the same excellent Ball Bearing Connection as Buffalo Nos. 66 and 68, but Drill is of considerably larger capacity than either of these.

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OF COURSE this is an impossible picture, but it will serve to call attention to the West Tire Setter, a tire setting machine that does all the work of setting a tire better than it can be done any other way, and in one minute, as against an hour by the old way. Every manufacturer of vehicles or wheels and every repair man and blacksmith should have one. Saves its cost and shows a handsome profit in a very short time.

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Price list sent upon application.

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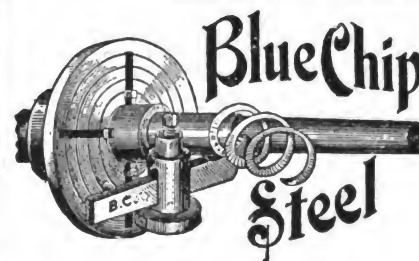
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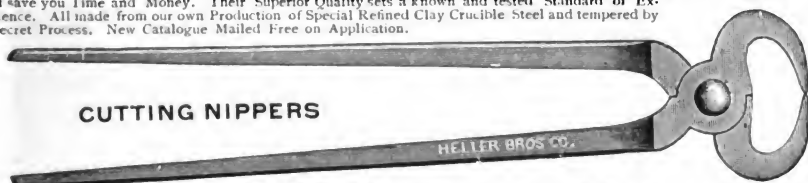
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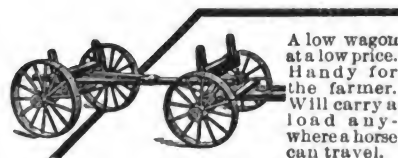
The shifting lever controls the length of stroke.

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Actually five hammers in one.

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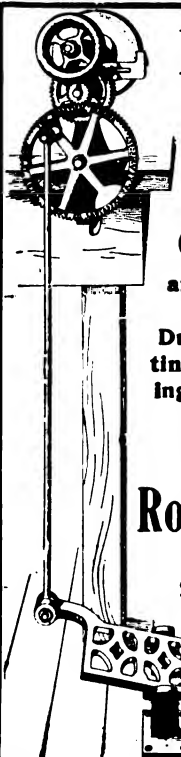
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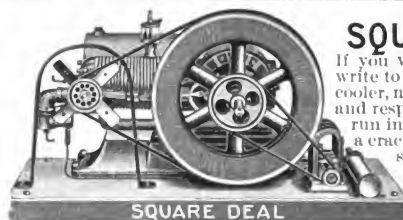
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Greenfield, Mass., U. S. A.



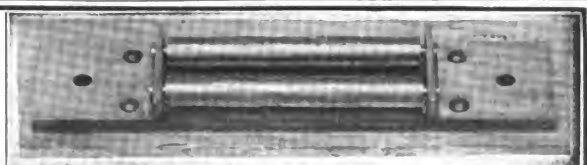
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# THE "DEFIANCE"

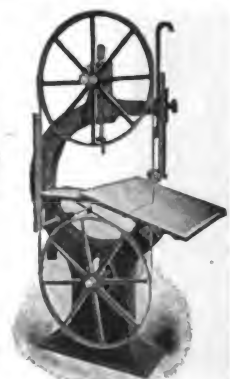
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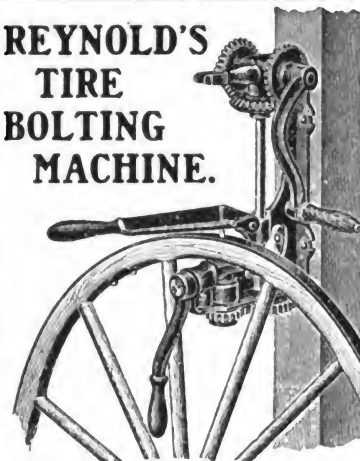
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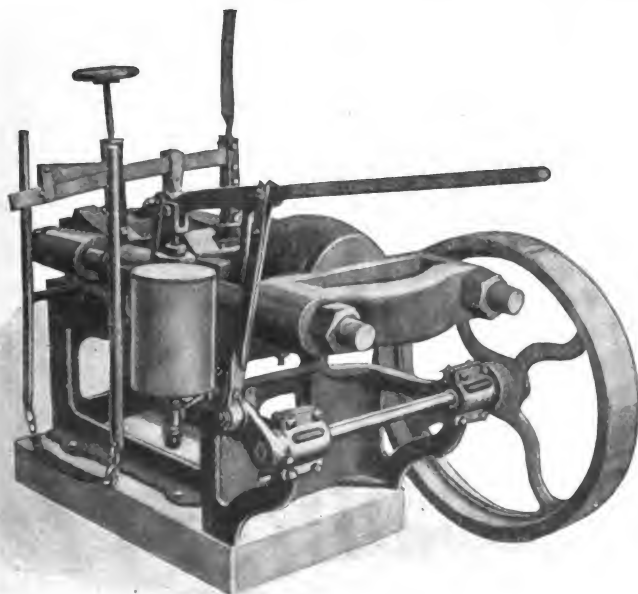
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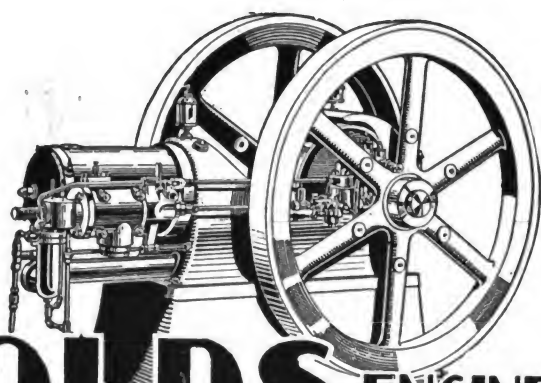
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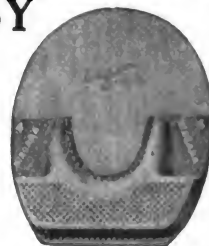
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Prevents strains,  
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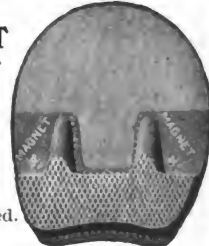


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# THE AMERICAN BLACKSMITH

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## A Matter of Price or Quality.

Every progressive smith who wishes to keep abreast of the century finds it necessary to continually add to his shop equipment and to install such tools, machines and supplies as will enable him to turn out better work more quickly and more cheaply. He is therefore continually called upon to decide whether he will allow price or quality to be the deciding factor in choosing his equipment. Smiths generally do not consider this a matter of importance, but it is nevertheless fully worthy of his careful attention. His success as a craftsman rests in good part on whether his equipment consists of tools, machines and supplies of quality, that are likely to last him as long as he stays in business or whether he pays most attention to price with the likelihood of a continual repairing and tinkering to keep the machines in fairly good working order. A penny saved in first cost usually swells to a dime for repairing.

Great lasting successes are founded upon the bed rock of quality and conservative business men generally are heard to say, "The best is none

too good" when doing their purchasing. What does it profit a man if he save fifty dollars on the cost of an engine only to spend seventy-five dollars worth of time and trouble in repairs to say nothing of the loss of trade necessitated by the "shut-down?" That smith is certainly lacking in business sense who will select a tool or machine because of its low price and with little or no thought as to its quality. In fact, the smith intending to build for the future—he who is seeking a full measure of success—cannot afford to buy any but the better classes of the tools and machines best suited for his purposes.

The craftsman who equips his shop on the basis of quality is most likely to turn out work of quality and this will bring trade to his door. Of course there are times when it is possible to get good tools and things at a reduced figure, but the question of quality should never be overlooked in any case. It is the exception when dimes worth of first cost do not save dollars worth of repairing. Yet some smiths gamble on this exception.

## An Engine Room for the Engine.

Few smiths seem to think this necessary. The gas engine, that great labor saver, is thought of by the average smith as a perpetual motion contrivance, which will run anywhere and under any conditions. At least such is our deduction, after viewing smith-shop plans for several years. We have observed several cases where a planer or saw was located almost "under the nose" of the engine. And one extreme case indicated an emery stand directly behind the engine foundation. Of course this is exceptional, but the cases where the engine is so located as to catch every passing cloud of dust or dirt are not so rare. Of course there are cases where it would be almost impossible for the smith to build a special room for the engine, on account, of lack of room. But those smiths who can, by any possible

arrangement, build or partition off a room for the gas engine, will in the end, find themselves the gainers.

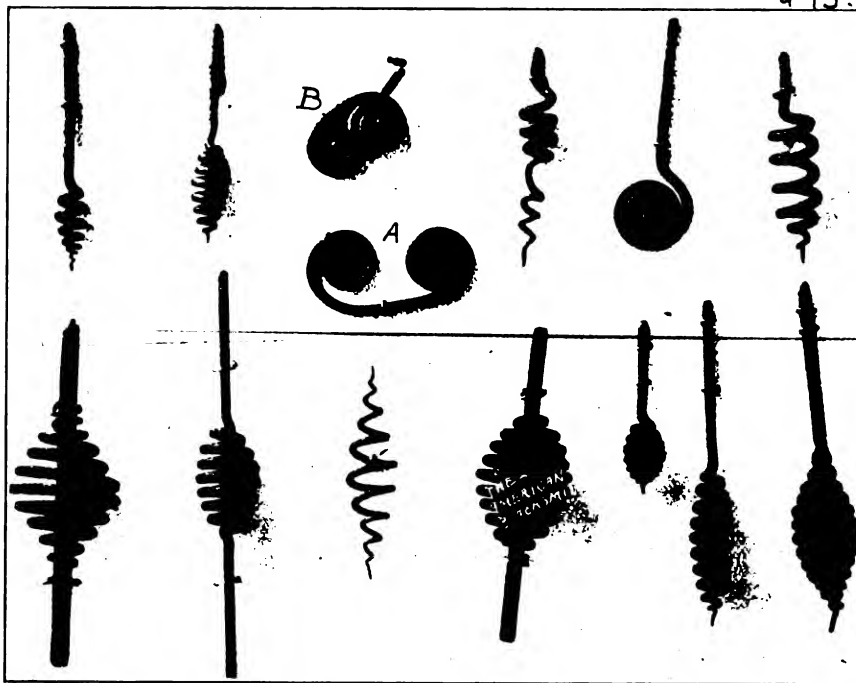
It is impossible to make a ruling for each case, as the floor space, dimensions of the shop and the number of the machines has much to do with the location of the engine. We can only suggest in a general way as to the best place for the engine room. It is unnecessary to say that a dark engine room is to be avoided at all hazards. Get as much natural light into the room as possible. At least two windows are necessary if the room be large. Another factor is cleanliness. Don't make the engine room the repository for everything that you "think will come in handy some day." Make the engine room worthy of the name—floor clean; tools in place; oiler, waste and such like on the shelf. Keep things ship-shape so that the engine can have no possible excuse for not running smoothly and properly. Make the room purely an engine and tool room, if space permits a tool cabinet. Protecting the engine from the dust and grit of the shop will enable you to get better service out of it, will prolong its life and you will have less trouble in keeping it in perfect running order.

## The Spirit of San Francisco.

The following is an extract of one of several recent letters received from our San Francisco readers, in reply to our letters asking how they had fared during the recent earthquake and fire which visited the city.

"Your letter just received and in reply wish to say, our shop and homes and the homes of our 26 employees were completely burned. We barely saved our clothing and a little bedding. We are at present rebuilding our shops and have placed an order for all our machinery. Some of it is on the way here now.

"We wish to continue taking THE AMERICAN BLACKSMITH, as we consider it a necessity now, just as we did



THE SPIRAL IS FOUND IN MANY RICH EXAMPLES OF ART IRON WORK.

formerly, possibly more so.

"We thank you for your kindly interest in our welfare and hope that we have given you the desired information."

Such is the "Frisco" spirit. This smith who has lost both home and shop is already rebuilding and installing machinery. They have not been discouraged by the awful catastrophe. But, on the contrary, it has

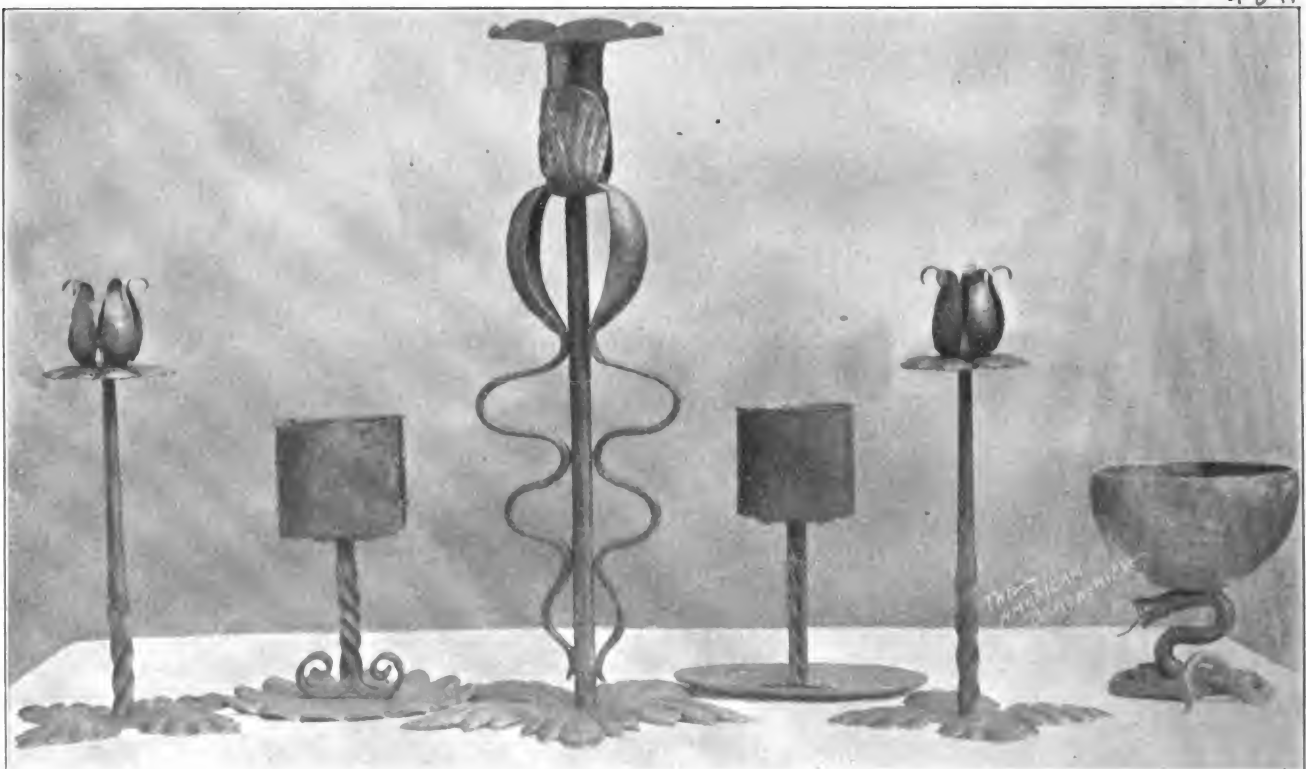
urged them to work the harder to get things into better shape than ever before. The courage and grit shown by the people on the Pacific Coast is of the pure Yankee brand and the San Francisco of the future will rise steadily and majestically from the dust of the recent catastrophe.

In the letters to our San Francisco friends who suffered on account of the earthquake and fire we inquired

as to the possibility of their again starting in business and also whether or not they wished to continue taking this publication. The reply quoted above is typical of those whom it was possible to locate, and it is indeed gratifying to note that although their homes and shops are gone our friends will need and want THE AMERICAN BLACKSMITH as before.

#### The Spiral as used in Ornamental Iron Work.

The accompanying engraving shows a number of spiral shapes and forms used in ornamental wrought work. These were all forged by one of the boys at the Illinois State Reformatory with the aid of a hammer and an anvil. These twists are especially well made and show both skill and care on the part of the operator. They are evenly formed and are worthy of being used as patterns by those readers who are looking for a neat twist or spiral to embellish some piece of art work. The method of forming these spirals is as follows: Draw a long taper from the center toward each of the ends of a piece of round stock. Then coil the piece up like a rope from both ends toward the center. Upon reaching the center with both ends, slide one coil over the other. These operations are shown at A, and B, in the engraving. After the piece is nicely coiled heat it and pull the coils open.



SIMPLE BUT CAREFULLY EXECUTED WORK IS GENERALLY PREFERRED TO THE EXTREMELY ORNAMENTED PIECES.

The coils may be opened to any degree and with slight variations in the twisting, other beautiful effects may be had. This same method is also used in working out the tendrils required in some designs.

The other engraving shows several wrought iron candle sticks, two match holders of copper and an ornamental copper bowl with snake standard. These are rather simple pieces but at the same time show thought and care. The twisted part on the rods of the smaller candle sticks is effected

engine ready to do this, for at times there may be no polishing to do for two or three hours. If I want to rip a plank or make a wagon reach I can start in a minute. If I had steam power I would have to spend an hour sawing by hand or else wait till I had enough steam.

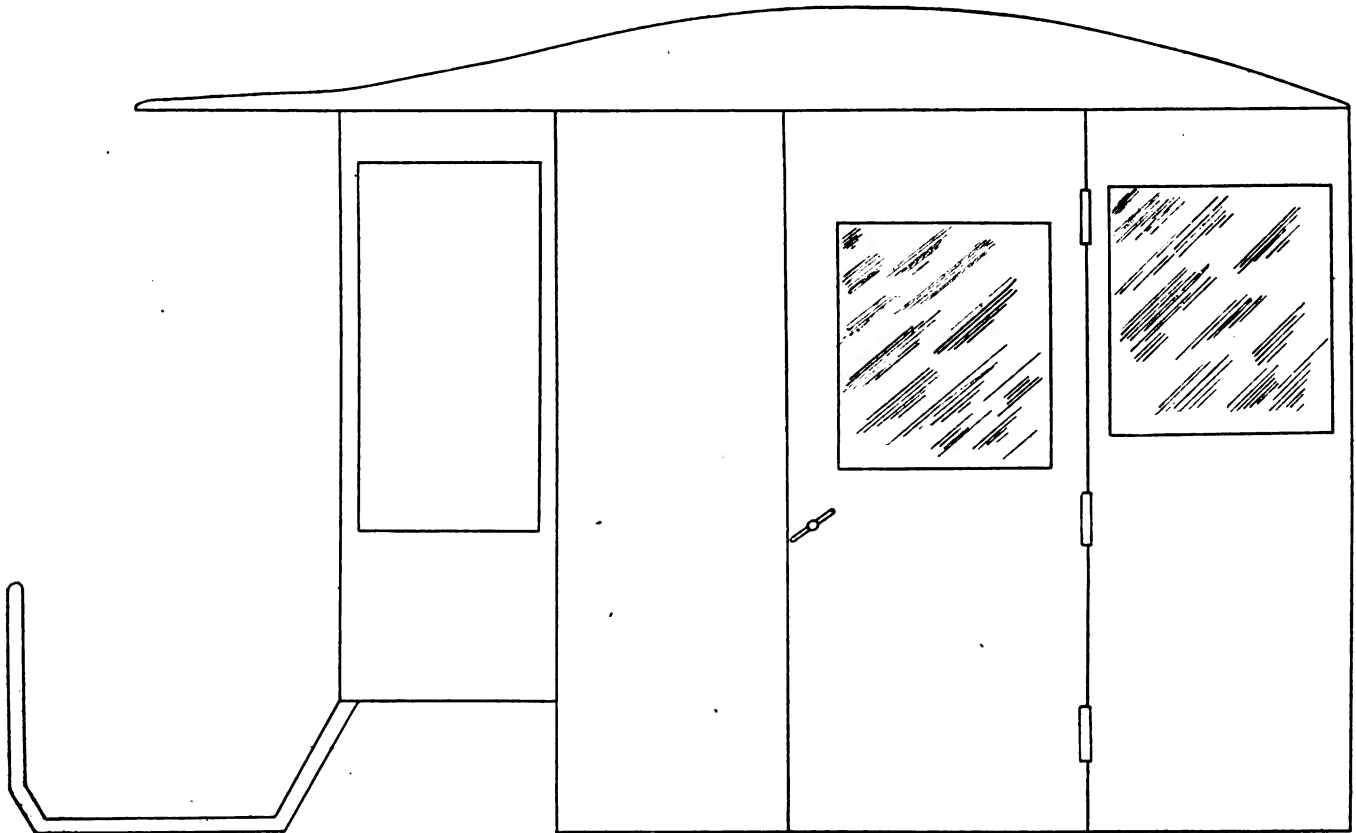
It pays to have a gas engine because one man with power can do as much as two without it. You can start your engine, go about your work, and do more work because you do not have to take the time to keep

the best for a blacksmith. I run a trip hammer, disc sharpener, emery wheels and saws with my engine. Steam power is all right for large shops and factories where they run steady but a gas engine is the best engine for the blacksmith.

#### How I Built a Doctor's Cab.

L. E. PHIFER.

The cab is made of light material throughout. The running gear is from a top buggy with one-inch axles and one forward spring and two behind.



A SIMPLE AND EASILY CONSTRUCTED CAB ESPECIALLY SUITABLE FOR A DOCTOR.

by squaring the portion of the round stock to be twisted and then heating and twisting it to the required degree.

#### Does it pay to put in a Gasoline Engine?

M. J. M.

I say yes, because it is the cheapest power. I have an 8-horse-power Waterloo Gasoline Engine and I can start the engine and sharpen and polish a plow in 15 minutes. I use a trip hammer. Some days I start and stop this engine fifteen times. I go to work in the morning and in a very few minutes after I get in the shop I can have power up and be sharpening discs. I polish all my shovels and plows, so you see what an expense it would be to keep a steam

up steam. It pays because you do not need any high priced engineer and there is no possibility of explosion, no danger of fires, no early firing up to get up power, no leaky flues, no boiler repairs of any kind, no waiting on steam and best of all there is no consumption of fuel before starting and after stopping.

It will bring you trade to have a gas engine in your shop, for when a man brings a job, you are ready for it. A gas engine will pay for itself in a short time, by the increased capacity of work you can do. It does not take up much space and you can run them in most any building and they are clean to handle. I have used steam, horse-power and gasoline and find that gasoline engines are

The length of the gear from the front axle to the rear one is six feet ten inches. The frame for the bottom of the body is four feet long and two feet eleven inches wide. This frame is made of yellow pine, 1½ by 2-inch straight grained stock. The upright pieces are of the best cork pine and are mortised into the bottom frame. The top boards, one on each side, are 6 feet 10 inches long, 1½-inches thick and 5 inches wide at the broadest part. These two pieces are tapered toward the front and rear to give the proper shape to the top. Between each set of two uprights are three braces or supports. The uprights are fourteen in number. The front uprights are of oak, 2 inches by 4 inches and are bolted to the cross piece at the top

and mortised into the bottom frame. The front part is then mortised into those hard wood pieces and so made to allow the front wheels to pass under the seat in turning. Rods of  $\frac{1}{8}$ -inch round stock, eighteen in number, hold everything in place. There are three 16-inch square windows in the cab; one in each door and one in the rear. The windows in the panels next to the doors may be slightly larger. The inside of the cab is upholstered and is arranged to accommodate two persons.

The dimensions of the various stock for the cab body are as follows: The floor is of 4-inch flooring; the front uprights are 2 by 4 inches of good oak stock. The cross pieces forming the foundation frame of the foot-board and seat are 2 by 10-inch elm lumber. The uprights at the rear of the driver's seat are 2 by 4 inches. The uprights framing the cab proper are  $1\frac{1}{2}$ -inch square cork pine. The top pieces on each side are 6 feet 10 inches long by  $\frac{1}{2}$ -inch thick by 5 inches at the widest part. These pieces are tapered to give proper shape to the roof of the cab. The frame work is sided with  $\frac{1}{2}$ -inch white pine. The top is covered with oil cloth.

I did this job after other workmen refused to do it, some saying they couldn't do it. And right here I want to say that when a man says he *can* do a thing and he acts, he cannot help but accomplish his task. I always pick out work that other craftsmen say can't be done and I usually succeed. Here's another point; in doing all wagon repairing get your customer to let you use new material. The old stuff doesn't count for much and the job will be much more substantial and can be done much quicker than so-called "patch-work."

### Wagon Lettering for the Vehicle Painter.—3.

F. L. MARVIN.

Before taking up the remaining letters of the alphabet—those containing curves and parts of circles—let me again urge upon you to practice carefully and thoroughly the curves and arcs referred to in the first paper on this subject. It is hardly possible for the would-be letter-artist to draft with any degree of skill until his hand, wrist and arm are thoroughly trained and will respond readily and easily to every curve and twist desired. The curved letters—if they be so called—especially require practice in stroking.

The letters to be considered now are: B, C, D, G, J, O, P, Q, R, S and U.

In taking up these let us consider the C, G, O and Q collectively. Perfect mastery of the circles will make the remaining letters of this group less difficult. To make the O, start at the center of the top of the letter and make the left side stroke. Bringing the brush down quickly and keeping the stroke even all the way. Then start at the top again and make the right side stroke bringing it round and curving it exactly like the left curved stroke. The inner circle of the letter is now made, care being

G, are composed of strokes similar to those of the O and Q. They are both open at one side and short straight lines give them their finishing and distinguishing marks. The letter J, will be found very easy and is simply a pillar stroke with an arc at the lower end. The letter U, is closely related to J, and is merely two pillars joined by an arc at their lower end. Care should be taken not to get this letter either too wide or too narrow. The B, P, and R, are next considered. These letters

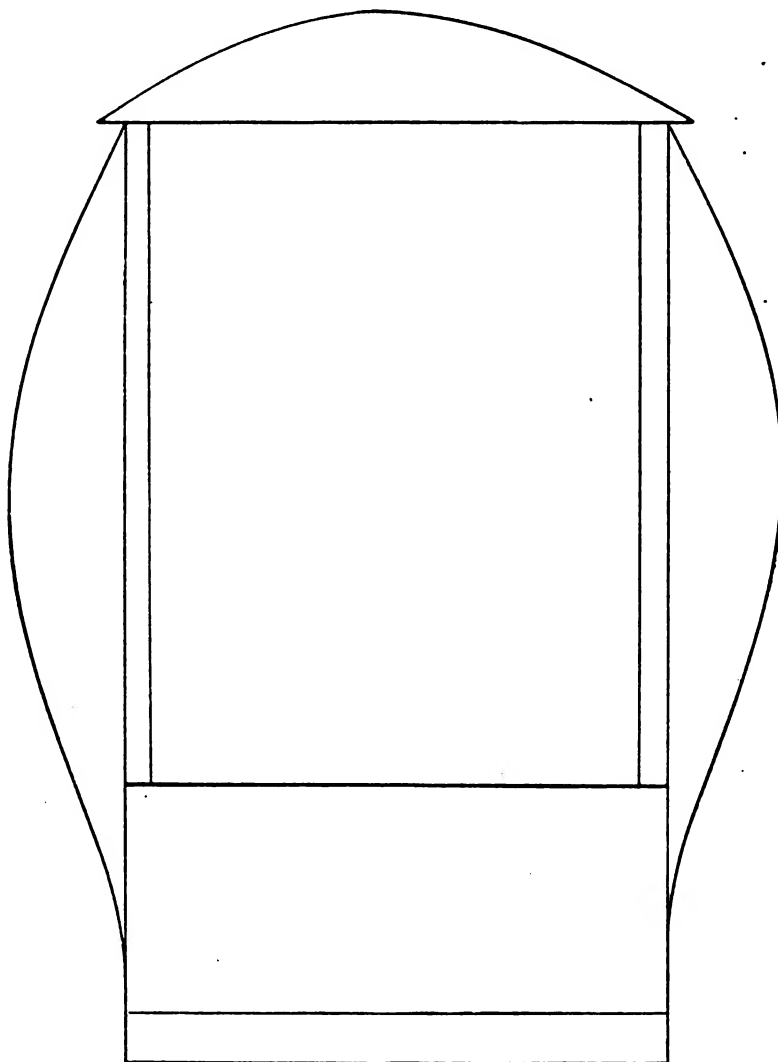


FIG. 2.—SHOWS THE FRONT VIEW OF THIS SIMPLE CAB.

taken to get it symmetrical and of such form and shape as to present a good appearance in conjunction with the outer circle. The space between the inner and the outer circles is now filled in. The Q, is so closely related to the O, that little is to be said except that the "tail" has much to do with this letter's appearance. It should be made very carefully and with a view of giving to the finished letter a "catchy" appearance. The C and

all contain a pillar stroke and this in each case is made first. Then, as in the case of the B, two right curved strokes are added. The upper oval should be slightly narrower and smaller than the lower oval and in joining them the bottom and inside of the upper oval should be the top and outside of the lower oval. Likewise, the bottom and outside of the upper oval is the inside and top of the lower oval. The appearance of this letter



depends in most part upon the relative size and shape of the ovals. The oval of the P, is made slightly larger and more circular than the upper oval of the B, and the lower part of the oval comes slightly below the center of the pillar. The R, is

action," well balanced and not lopsided. This is a very difficult letter to make but when once mastered it can be made in any number of beautiful shapes and designs. The character & is also very difficult but when you pick out its similarity to a combination

or colts, alfalfa seems to furnish just those elements required for developing strength and vigor and in some parts of the country no other roughness is used for feed. In changing from timothy, prairie or other hay to alfalfa the change must be gradual, as the horse is liable to a number of derangements, the rich hay stimulating nearly every physical process. Those horses which have been practically raised on alfalfa or whose digestive apparatus has become accustomed to so strong a feed, live and work hard to a good old age, but the change in feed must be very gradual and accompanied by a decrease in the grain allowance. The riper alfalfa hay, that more advanced in growth at the time of cutting, is best for horses and the animals should be given plenty of exercise.

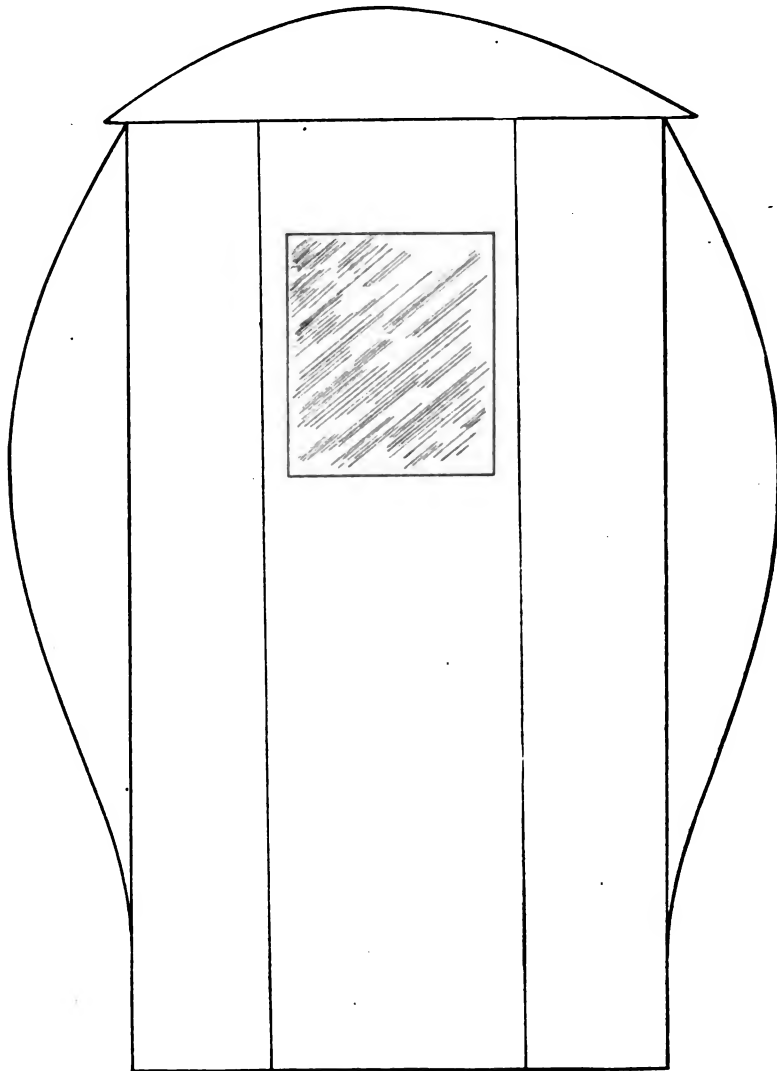


FIG. 3—SHOWS THE REAR ELEVATION OF THE DOCTOR'S CAB.

simply the letter P, with a right slanting stroke to support the oval. The good appearance of this letter depends upon the position of the slanting stroke. The letter D, consists of a pillar stroke with a long sweeping oval stroke connecting its ends. The letter S, is without doubt the most difficult letter in all the alphabet. It is made by describing the top oval first. Then the compound curve—that snake-like stroke—and lastly the bottom arc. The "belly" of the S, should be graceful and extend a little beyond the end of the top stroke. Of course, the top half of this letter is made slightly smaller than the lower half. In making the S, be careful to get it graceful and "full of

of C and S, its making is simplified considerably. There are several styles of making this character but if one style is thoroughly mastered others more or less original can be executed very quickly and artistically.

*(To be continued.)*

#### Alfalfa as a Horse Food.

The value of alfalfa as a developer of draft horses is not to be questioned and when size and strength are sought it is the best pasture known. The hay alone, however, is too rich a feed for the mature horse and it is therefore advisable to use it only as a balanced ration. A mixture of alfalfa with corn fodder or other rough feed is recommended. For young horses

#### Thornton Talks on Letter-Heads and Business Cards.

"The letter-head and business card are factors of no little consequence in the business world" said Thornton the other day when we dropped in for a short chat. "Now here is a chap" he continued picking up a letter from the table, "who has been after my trade for some time. But he won't get it. Why? Simply because his letter head is cheap, gaudy and impresses me unfavorably. The man himself may personally be very much of a business man but his business literature doesn't show it. Now take my letter-head." We could detect just a note of pride in his voice "I have tried to get something neat and yet attractive and I honestly believe I have succeeded. The type is plain, easily read and not more than two styles are used. I might have used an original illustration and am now working out one for use in my next lot of stationery, but at the time these were printed I had little time for anything but shop work. This letter-head has been in use for several months and many prominent business men among my customers have complimented me upon it. Those customers with whom a smith seldom comes into personal contact are favorably impressed by a letter-head like this and it tells them that you are not only a good smith but a business man as well."

"Use a business card? Why yes, I use some, but not many. The majority of smiths abuse this little piece of business cardboard. They get the printer to fix up a bunch of type, which

may or may not harmonize and the face of the card usually shows from four to ten styles. Then to cap the climax, the smith will get up ten or twenty lines of so called poetry and

as a customer, so I need to make use of good, strong letters. These of course are written on a type writer." In conclusion Thornton said that the trouble with most smith's was that

with a shank narrower than the body adjoining the V part. This narrow shank is fitted into holes in the plank or wood base, this adjustment being necessary for bending the various sizes of tires. The engraving will, I think, tell exactly how this device is made. My helper and myself have bent two tires six feet in diameter and 5 by 1½-inches in one hour.

"The Best of Everything for Horse, Stable and Vehicle"

## THORNTON'S

THIRD STREET

Phone 761

"Quality"

A GOOD LETTER-HEAD MEANS MUCH TO A BUSINESS HOUSE.

have the printer put this on the back of the card. Now this to my way of thinking is anything but the correct thing to do. Very few smiths are poets and those who really are, generally find some other outlet for their brain products. This poetry business on the card will also give a business man—the man you want as a customer—the impression that you are not much of a smith or you would appeal to him on a purely business basis. My business card is a reproduction in miniature of my letter-head and is of a good white stock printed in black. The back of the card bears a partial list of the work done in the shop with a list also of the goods sold at the smith-store. I figure that a card of this kind appeals to a man's business sense—is truly and purely a business card. When making business calls or in other words soliciting business, I use these cards with discretion. For instance, I call upon the manager of a coal company. Instead of handing in my business card and giving him a chance to say he hasn't time to see me, I introduce myself without any business handle. I usually find that a man will talk to you then, if only to find out what you have to talk about. Then, when I have his attention I talk business—good, straight, honest, straight-from-the-shoulder talk. Of course I don't land every man I visit, as a steady customer but I bring my business to his attention in a business manner. After telling him why he should trade with me, I present one of my cards and ask him to keep it as a reminder. This I think is a proper use of the purely business card."

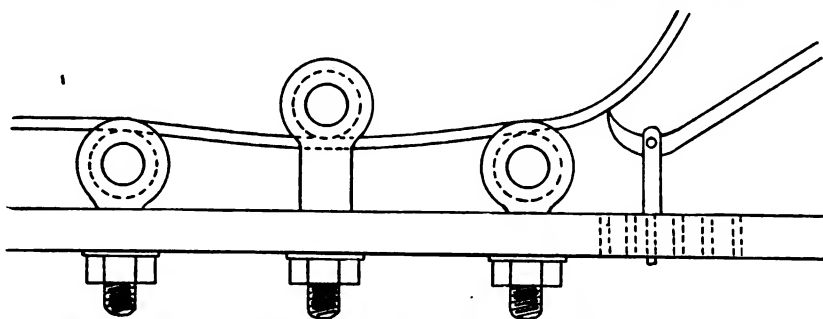
When asked if he went after prospects with letters, Thornton said, "I use letters, but find that personal solicitation is productive of more results. Of course I couldn't possibly call on every horse owner that I want

they didn't treat business in a business way. He also said that it was better for the smith to occasionally change his letter-head for the better and when ordering business stationery to not order more than will last him for two years at the most.

### A Home-made Tire Bender.

W. E. WANSBROUGH.

The accompanying engraving shows a plan of my home-made tire bender. This machine, if it may be so called, is very simple, easy to construct and really a wonder in operation. The only materials needed to construct



A SIMPLE TIRE-BENDER EASILY MADE.

this very useful yet simple device are, a stout piece of hard wood timber. This plank need not be very wide but should be of sufficient thickness to be thoroughly solid for the heavy work to which a machine of this kind is subjected. The three eye-bolts should be thoroughly and substantially made from some good stock. The two end bolts are forged the same as ordinary eye-bolts and are sunk into the plank to the eye. The center bolt, however, has the screw-shank smaller than the part of the bolt directly adjoining the eye. The length of this thicker portion is the same as the width of the eyes of the other bolts—outside to outside. The lever made be forged from an old axle and is shaped similar to a pinch-bar. The Y in which this lever works is made

and it is always ready to save me a hard job. I also have a rotary belt-driven pump and make the engine do all my pumping as I use a great deal of water. I also have a pipe from my pump to the house with a few places to connect a hose for sprinkling purposes and there is nothing nicer in case of fire.

The best thing a blacksmith can have is a good gas engine, and good machinery. I can start the engine and rip a log 10 feet long easier and quicker than I could by hand and all such improvements increase trade for a smith and this is what we want. If I did not have this machinery to work with I would have to fill the time by the sweat of my brow and it would not pay half as much and it would not be near the pleasure. The gas

### Gas Power for the Smith Shop.

F. L. W.

I am a user of a 5 horse-power gasoline engine. I have used it for several years but it paid for itself before the year was up. It never fails, and it takes but two gallons of fuel or 26 cents to run it for 10 hours. I make land rollers and also sell logs to other smiths to make rollers. I make a good profit on the logs ready for a roller. I bore a hole through them then turn them with the engine. The engine and I together can make \$9.00 a day on the logs. I also have a wood lathe that comes quite handy. The engine does all my ripping. I have an emery wheel and also a metal lathe that swings 13 inches by 42 inches in width. My engine also does my drilling

engine is truly the blacksmith's best friend and in refusing to install one he simply neglects to lighten his labors.

### A Safety Attachment for the Automobile.

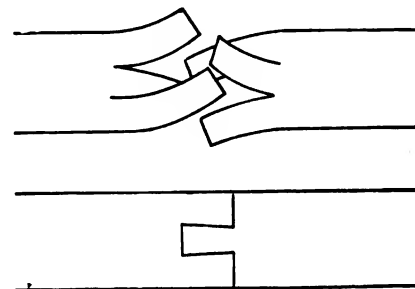
DAYTON O. SHAW.

The bronco bucks, the mule balks and the automobile "backs," and this "backing" has caused automobilists quite a good deal of trouble, especially among the hills of New England. For safety some owners have put on the rear axle, an attachment working on the principle of a "Samson" on a lumber wagon. We put such an attachment on a machine last year. The first time it was used the carriage was going good speed backwards, and when the driver let down the dog, it held all right, only one side was raised and the machine had the ridiculous appearance of kicking up behind. The owner was not discouraged however, but had an attachment put on the other side, so that if the stern raised again, she could come up on an even keel.

Sometimes a customer brings a draft of what he wants, then all we have to do is to work according to the drawing. At other times he simply gives the principle and leaves us to design and construct in our own way.

but will give the one I consider the easiest and most practical to make. It is made the same as you would forge a heavy axle clip with a hub in the center for the dog to work in. It was made for a  $1\frac{1}{2}$ -inch square axle. Take a piece of  $1\frac{1}{4}$ -inch square soft steel  $3\frac{1}{2}$ -inches in length A, split back to  $1\frac{1}{4}$ -inches B, and turn the ends back. I use the  $1\frac{1}{2}$ -inch square hole of the swage block. Put a plug into this that will come up within  $1\frac{1}{4}$ -inches of the surface. This brings the split part  $\frac{1}{2}$ -inch above the block. Now take a heat and flatten down to  $\frac{3}{4}$  or  $\frac{1}{2}$  of an inch as you like. (C) This makes the strap  $\frac{1}{2}$ -inch wider on each side of the hub or  $1\frac{1}{4}$ -inches wide. Finish to the size you want after getting your length and use a top and bottom fuller. Draw out your ends as at D, and round them up to  $\frac{3}{8}$  of an inch thick. Now form it to a  $1\frac{1}{2}$ -inch square shaft. I have the slot in the hub milled, but if there is no machine shop near, and it is found necessary to put the slot in yourself, punch a  $\frac{1}{2}$ -inch hole up close to the edge of the strap, and cut out the core, then form over a piece of  $\frac{1}{2}$ -inch flat iron. The dog E, in this case was made of  $\frac{1}{2}$ -inch soft steel, 24 inches long, one end upset and flattened to  $\frac{1}{2}$ -inch thick, by  $\frac{1}{4}$ -inch

screw them in a vise, so as to shape them together, and get them in line. Take the dog out before the hub cools so it will shrink a little. The dog will not play easy, but by working it in the slot you can see where it



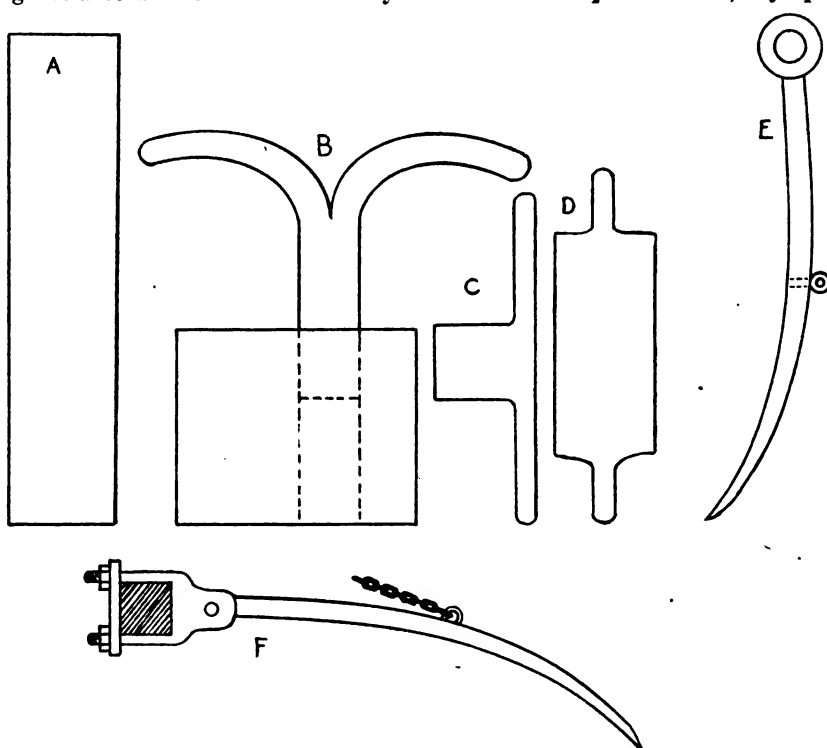
SOME SMITHS ARE ALREADY ACQUAINTED WITH THIS METHOD.

bears. Then smooth it (only where it bears) with a fine cut file. Continue this until it works easy, and you will have a good running bit. Now while you are doing your drilling, drill a  $\frac{1}{8}$  inch hole at X, about half up from the end of the dog. Counter-sink this hole on the under side. An eye bolt is riveted in here, a chain connected and run up forward where the driver can reach it. We use a plated chain such as plumbers use. To make an eye bolt cheap, I turn the end to a right angle back far enough to make the ring. Work the corner up a little and scarf, also scarf the end and turn and weld. This gives a full round hole. In the engraving F, is a side view of the attachment, the axle being shown in section and the clip which holds the dog being attached.

### The Clinch Weld for Springs and Pilot Bands.

WM. P. CARROLL.

Here is a good wrinkle in welding broken springs, leaves or the pilot bands on locomotives. The ends of the pieces to be welded are slightly upset and then scarfed with a fuller. Now split each of the ends into thirds with a chisel, the length of the splits depending upon the thickness of the stock to be welded. Now take one of the pieces and bend the two outer thirds down and the center part up. On the other piece the center piece is bent downward and the two outer divisions upward. The two pieces properly bent are shown in the accompanying engraving. Now push the two ends together and clinch them by hammering the ends down. The outer edges are also bent slightly side-ways so as to clinch the center tongues tightly. You now have a

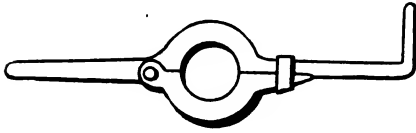


A SAFETY ATTACHMENT IS NECESSARY ON SOME MACHINES.

In such cases it is best to do the job the easiest way that will make it look well and be strong. I have put these attachments on from different plans

in diameter. The other end is flattened and turned down after the manner of a pinch bar. Now heat the hub, put the dog in the slot and

clinch that cannot work apart in the welding. Now place the pieces in the fire and when the right heat is obtained you will find the pieces will weld quickly and easily and you can make a good job of it. In weld-



IF IT SAVES TIME OR LABOR IT'S WORTH USING.

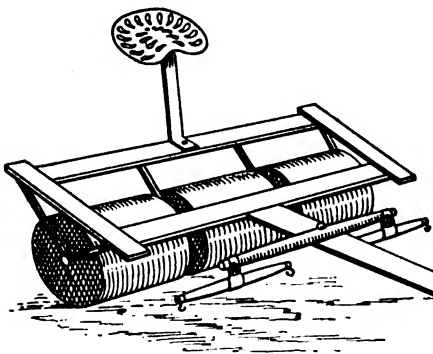
ing pilot bands clinch them in the same manner, welding up and then trimming the edges with a chisel and then flattening with the hammer.

### A Labor-Saving Nut for the Wheeljack.

WALTER M'COY.

Everyone of us knows what a job and long turn it is to screw the nut down tight against the wheel on the wheel stand when an old style solid nut is used. I herewith offer a simple contrivance which will save the wheel repairman lots of turning and consequently lots of time. It is a hinged nut which, after the wheel has been placed on the stand, is opened and placed on the hub of the wheel and clamped shut around the rod and then screwed down tight. When ready to remove the wheel a slight turn of the handle of the nut, a pull on the band holding the nut together and it is removed from the wheel-jacks.

In making this nut, forge separate pieces and fit them accurately together. Now rivet the hinge neatly counter-sinking on the lower side. Then bend a stout band for holding



A GOOD LAND ROLLER CAN HARDLY BE DISPENSED WITH ON ANY FARM.

the nut and clamp it tightly. The two parts of the nut that come together under the band are slightly wedge shaped so as to permit being held firmly. After clamping firmly

drill a hole of the required size and cut an inside thread to fit the screw on your wheel-jack.

### An Excellent Farm Roller.

GEORGE C. VEDDER.

A good land roller can hardly be dispensed with on any farm and smiths in the agricultural districts are often called upon to construct them for their customers. A roller that does not tear up the ground when turning, is light upon the necks of the draft animals and can be disposed of at a low price is shown in the accompanying engraving. The contrivance is constructed as follows: Select a good hardwood log of the required diameter (the larger to a certain degree the better) and as nearly cylindrical as possible. Having removed the bark, saw the log up into the required lengths for the rollers; that is, have each of the sections about two feet in length. Then having struck a center and worked them to a uniform size, so that all will turn alike, bore the holes for the axle. The holes for the axle should be about  $2\frac{1}{4}$  inches in diameter. Now mount the rollers on a rod of good round stock about two inches in diameter.

The frame work, as shown in the engraving, is now constructed and attached to the axles by means of pieces of old wagon tire. These pieces or braces are eight in number—two at each end and two between each of the rollers in the center. These braces are welded to the axles in such manner as to keep the rollers in place and yet to allow them to turn readily. The tongue is now attached to the frame above the rollers. Now attach an old mowing-machine seat to the frame. This is a convenience to the driver and helps to counterbalance the weight of the tongue, and so make it less wearing on the necks of the horses. Having the roller in three sections makes it easier to turn around than if made solid or even in two pieces. This is a cheap, simple and very practical land roller and the country smith can well occupy his slack time by making them

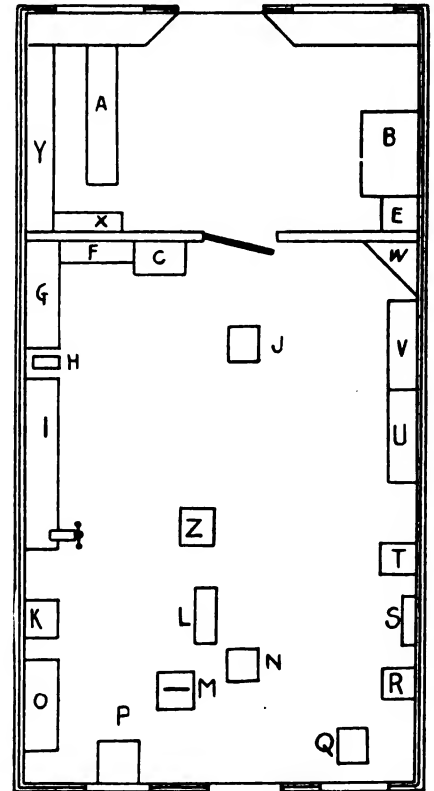
for such of his farmer customers, as require a good, sensible, farm implement.

### A Hardware Store and Repair Shop Combined.

MYERS BROTHERS.

Our shop is 42 by 20 feet and is divided into two parts: The office and store where the ammunition, guns,

bicycles and shelf hardware are displayed and sold and the repair shop in the rear where all manner of repairing is done. Besides the ammunition, guns, etc., we also handle farm implements and are generally kept very busy. We make it a rule to never turn any job away until it is fixed, although we often experience some pretty difficult propositions.



THE CUSTOMER DOES BUSINESS IN A NEAT OFFICE.

The engraving herewith is a plan of the first floor of our shop. A, represents a showcase; B, is a desk; C, is a bolt case; D, is an anvil; E, is the safe; F, is a drill rack; G, tool rack; H, small emery; I, bench; J, wheel stand; K, boring machine; L, spoke chuck; M, rip saw; N, wheel stand; O, iron and wood lathe; P, gasoline engine; Q, band saw; R, fine grind stone; S, lawn-mower sharpener; T, heavy grind stone; U and V, workbenches; W, paint rack; X, is a gun rack; Y, case for ammunition and Z, represents the stove.

### A Shoeing Shop in Alaska.

JAMES H. PATTERSON.

I would rather pound iron than write letters any time, but suppose that THE AMERICAN BLACKSMITH readers would be interested in a picture of an Alaska blacksmith shop. The accompanying engraving shows my shop as it appears in summer. The dogs shown



in the picture work in harness. Our prices are proportional to the price we get for shoeing which is four dollars per head. We have little wagon work

am located in an iron mining town of about 15 thousand people of all nationalities. My motto is "Good work at a living price."



IN WINTER THE SHOP IS NOT RECOGNIZED AS THE SAME.

as yet but considerable sled work is done. I do not appear in this picture but my partner is shown nailing on a shoe. I will say that as long as I follow the business I shall take THE AMERICAN BLACKSMITH if I am where I can get it.

Editor's note.—Mr. Patterson also sends in a picture showing his shop in winter, but the photograph is so faded as to make a good engraving impossible. This picture shows that the Ice King reigns supreme during his season. The path to the shop door is between high banks of ice and snow and the front of the shop is shown thickly covered with icicles.

#### A Neat Shoeing Shop of Michigan.

A. H. FORDYCE.

The accompanying engraving shows an interior view of my shop. I make a speciality of horseshoeing and have ever since I've been in business; now about five years. As in every other place there are all kinds of prices, but I charge 50 cents for common machine made shoes. For resetting I get 25 cents; hand turned shoes 75 cents each; side weight shoes and bar shoes the same; while for bar shoes with leather pad I get one dollar each.

I work for those who wish a good job and not a cheap one. I do repairing in connection with my shoeing and also handle harness goods for a side line. I have also started an automobile garage and repair shop. I

#### More About Tubal Cain.

The following letter from the Morse Twist Drill and Machine Company explains itself. "We note in the May issue of THE AMERICAN BLACKSMITH, 'A question for the author of Tubal Cain.' We enclose herewith the whole poem as written by Mr. Mackay and

On the iron glowing clear,  
Till the sparks rushed out in scarlet showers,  
As he fashioned the sword and spear.  
And he sang—"Hurra! for my handiwork,  
Hurra! for the spear and sword,  
Hurra! for the hand that shall wield them well  
For he shall be king and lord!"  
To Tubal Cain came many a one,  
As he wrought by his roaring fire,  
And each one prayed for a strong steel blade  
As the crown of his desire;  
And he made them weapons sharp and strong,  
Till they shouted aloud for glee,  
And gave him gifts of pearl and gold,  
And spoils of the forest free.  
And they sang—"Hurra! for Tubal Cain,  
Who hath given us strength anew!  
Hurra! for the smith, hurra! for the fire,  
And hurra! for the metal true!"  
But a sudden change came o'er his heart  
Ere the setting of the sun,  
And Tubal Cain was filled with pain  
For the evil he had done;  
He saw that men, with rage and hate,  
Made war upon their kind,  
That the land was red with the blood they shed,  
In their lust for carnage blind.  
And he said—"Alas, that ever I made,  
Or that skill of mine should plan,  
The spear and the sword for men whose joy  
Is to slay their fellow man."  
And for many a day old Tubal Cain  
Sat brooding o'er his woe;  
And his hand forebore to smite the ore  
And his furnace smouldered low.  
But he rose at last with a cheerful face,  
And a bright courageous eye,  
And bared his strong right arm for work,  
While the quick flames mounted high.  
And he sang—"Hurra! for my handicraft!"  
And the red sparks lit the air;  
"Not alone for the blade was the bright  
steel made;"



A NEAT SHOP IS ALWAYS INVITING TO YOUR CUSTOMERS.

wish we might be able to answer but have no record previous to Genesis IV, 22." The following is the poem entire as written by Mr. Charles Mackay:

#### Tubal Cain.

CHARLES MACKAY.

Old Tubal Cain was a man of might  
In the days when Earth was young;  
By the fierce red light of his furnace bright  
The strokes of his hammer rung;  
And he lifted high his brawny hand

And he fashioned the first ploughshare.  
And men, taught wisdom from the past;  
In friendship joined their hands,  
Hung the sword in the hall, the spear on the wall,  
And ploughed the willing lands;  
And sang—"Hurra! for Tubal Cain!  
Our staunch good friend is he;  
And for the ploughshare and the plough  
To him our praise shall be.  
But while oppression lifts its head,  
Or a tyrant would be lord,  
Though we may thank him for the plough,  
We'll not forget the sword."

### The Great Men Pass.

MARGARET E. SANGSTER.

The great men pass. We stand appalled  
and say,  
"How shall we live, when these have left  
our day?  
How shall we fight, when splendid leaders  
fall?  
How work, when silent is their bugle-call?"  
Ah, friends, the great men pass, but great-  
ness lives!  
Strength for the work the Master Work-  
man gives.  
From heaven's high wall of jasper, true  
and clear,  
Rings out the clarion call; we need not fear.  
God's battles do not cease—still in the van  
The Captain's banner flies; the Son of Man,  
True Son of God, and deathless, leads the  
way;  
To-morrow shall make up for yesterday.  
The great men pass, but pass into the light,  
Their brave feet climbing up some heavenly  
height.  
We need not fear, or great or small, if we  
Are workers for the vast eternity.



Make the shoes as light as possible these hot days.

"That's good enough" never increased the trade of any shop," said Thornton.

Drive away the "no-business-in-summer" bugaboo with several good big pieces of advertising.

Any shooting in your parts? Guns and ammunition should be a very profitable side-line.

He will never own a shop of his own who gauges his work by the size of his pay envelope.

Troubles and worries, like horses, will run away with us when they find we are afraid of them.

Don't lose sight of the business end of the trade. The successful smith must be a keen business man.

It's not workmanlike to drive anything with the side of the hammer or to use its handle as a driving block.

The Consul-General at Halifax reports the discovery of a large coal deposit at Kingsport, Nova Scotia.

Keep your finger on the pulse of things. Be posted on national and international events as well as the local election and the county fair.

A motor sleigh which has carried 27 people ten miles an hour through the snow is said to have been introduced by an Ohio concern.

"Afraid-he-can't" is the chap that "never does." Be a doer of things. "I will" is the spirit that builds a San Francisco, that turns defeat into victory.

From South Africa writes a subscriber: "I look forward to its arrival with great interest." Hardly necessary to add that he means THE AMERICAN BLACKSMITH.

Requests come in daily for pink stamps and we supply them promptly, too. Using your herd freely? We have a large supply for prompt shipment. Ask for them.

Take a copy of THE AMERICAN BLACKSMITH with you when you visit your neighbor smith. Lend him your copy occasionally and then get his subscription.

The Italian State Railway has just given a contract to the Baldwin Locomotive Works of Philadelphia for 20 engines, to be delivered during the coming summer.

Cheap machines are more bother than they're worth. Consult our advertisers about good goods. The best is none too good in the beginning and is cheapest in the end.

A good German blacksmith and wood-worker is wanted at Altona, Nebraska. This is a good opportunity for a good man. Write to Mr. George F. Thies of that place if interested.

Very popular are the premiums we give for new subscribers. The shoeing knife is a dandy. Most time you got a new one, isn't it? Yours if you get a new subscriber to THE AMERICAN BLACKSMITH.

What is your opinion on some of the questions now being discussed in the "Query Column?" You certainly don't agree with all that is said. Let us have your ideas. That's what the column's for.

The wise farmer or teamster doesn't continually interchange his teams nor does the wise smith continually change his working force. Both get good stock and keep it. Changes are bad alike for horse, man, owner and employer.

After the horse was stolen—it's the same old story. Get a pair of horse stocks before receiving a broken leg. Present your bill before your debtor moves. Install a side-line before your competitor does. He is always too late who is afraid of being too early.

There are really worse smiths than our friend Tom and perhaps T. T. isn't entirely responsible for the way he tends things. His father was a shiftless sort—mortgaged "house, home and farm" and this of course discouraged Tom pretty much.

Russia has just received the first of several hundred war automobiles ordered from a French concern. A Hotchkiss rapid fire gun is mounted on a rear turret and the gunners are screened with loop-holes for sighting. Two steel rails are carried which can be quickly unshipped and placed over a ditch. Truly a portable slaughtering machine.

The Sultan of Turkey has given Mr. Homer Davenport, the well known cartoonist of New York City permission to import several pure Arabian stallions and mares from Syria. No private citizen of this country has been so favored since 1853, when Mr. A. P. Richards of Kentucky brought three mares and two stallions to the United States. This importation of Arabians, which it is believed will number eight, will be of great value in the improvement of the American breed of horses and American horse breeders generally will be keenly interested in Mr. Davenport's Arabians.

The blood of the Arabian breed permeates, to a considerable extent all the race horse stock of Great Britain and to a greater or less extent the race stock of this country possesses a large share of English blood.

A Consular report says; "The greatest difficulty that railroads have to contend with in winter time is the blocking of switches with snow and ice. When the snow is wet and freezes, the difficulty increases. To overcome these serious conditions attempts have been made to heat the switches with electricity, but that has proved expensive and dangerous. Steam-heated switches have also met with but little success, due to the danger of condensation and subsequent freezing, which would entirely block the steam pipes. A new system has been developed in which oil is used in place of steam—hot oil of a special quality circulated through pipes placed between the ties. The advantage of oil over steam is that it retains the heat better, and will not chill to 25 degrees below zero. Furthermore, if it should chill, it will not expand and burst the pipes as water would when freezing. A test of the system on the Boston and Maine Railroad is said to have been very satisfactory."

United States is one of the most important countries for the refining and utilization of nickel metal, while the Province of Ontario, Canada is one of the largest producers. The Sudbury, Ontario, nickel field has long been known as the most important source of that metal in America, if not in the world, but the work of the last three years has brought out more and more strikingly the unique character of this mining region. It has been proved that all the ore deposits of any economic importance are at or near the outer margin of a huge laccolithic sheet of eruptive rock a mile and a quarter thick, 36 miles long and 17 miles wide.

Switzerland, Austria-Hungary, as well as France within the last few years have adopted pure nickel instead of the nickel-copper alloy for their coinage. The pure metal does not tarnish or change color, but keeps bright and attractive, and, as it is harder, the imprint stands wear much better. It is more difficult to counterfeit, since the minting requires more powerful presses.

The nickel production of the Sudbury field for the year, 1904, is given as 4,729 tons, valued at \$1,513,280, and the total production of the district since the discovery of the nickel deposits there up to and including the year 1904, at 43,877 tons, valued at \$12,660,069.

### The American Association of Blacksmiths and Horse-Shoers.

Every craftsman has observed a team of horses endeavoring to draw a heavily loaded truck out of a mud hole. If the horses pull together they have no difficulty whatever. But when first the one pulls and then the other, no headway is made and the horses simply wear themselves out. They pull and tug and tear up the ground, but the truck remains at a standstill. Ever think, brother craftsmen, how much the unorganized county is like the team, unable to pull together? The smiths pull every way but together. They work and pull and slave at their tasks and gain nothing. They wear themselves out working for low prices and dead beats, and of course their families suffer as a consequence. Now, Mr. Reader, why not pull together with your brother smiths? Get the good old craft wagon out of the mud hole of low prices and dissatisfaction and on to the good road of harmony and better prices. Here your load will go easier and bear lightly and you will enjoy your work. It's the "Heave-ho!" at the capstan that weighs the anchor. It's the working in harmony that brings every great success. Why not take advantage of this opportunity to better the condition of the craft in your county? Just write The American Association of Blacksmiths and Horseshoers for complete plans and pointers for forming branch associations. Don't hesitate to ask our aid. We want a branch association in every county, in every state in the Union, and we cannot accomplish this result without your co-operation. Won't you lend your aid to this movement? Won't you help the craft, your brothers and, most of all, your family and yourself? It will cost you just one cent and the trouble to address a postal and make known your wants. Don't you think it worth the cost? Surely your interest in the craft is sufficient to stir you to action. P. O. Box 974, Buffalo, N. Y., is the address. But be sure to write TODAY.

### Several Pointers on Brazing.

KRAUSE LUEHR.

Some AMERICAN BLACKSMITH reader are no doubt having difficulty in successfully brazing the broken parts of castings which come to their shops and as we do much of this work on farm implements and machinery will endeavor to help our brother readers.

Remove all grease or paint where the parts are broken and make a cut with a hack saw in broken parts, so that when pieces are put together, the cuts will be squarely over each other. Then insert a piece of sheet iron or steel in the cut, so as to hold the parts in position while being brazed (this steel will also strengthen it after the casting is brazed). Then place the casting in the forge, and heat to a bright red, applying powdered borax or brazing compound over the break until it flows freely. Then apply brazing spelter or spelter wire, rubbing the brass over the break with a small rod flattened on the end, and heating the iron until the brass flows freely over all parts of the break. We then leave the casting in the forge to cool or until the brass has set, so it can be removed without breaking.

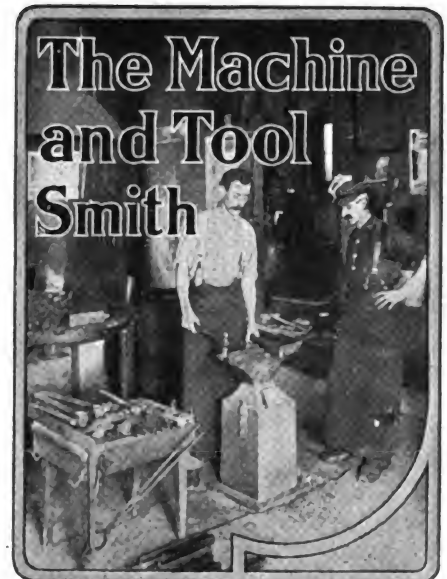
It is not advisable to cool a brazed casting in water as the sudden cooling may loosen the brazing. We have been using a High Pressure No. 2, Brazing Forge (National Cement and Rubber M'fg. Co.) for five years, and have no better paying machine in the shop. We can braze almost anything that comes in to be repaired. Hardly a day passes in which we do not have something to braze, and the fact that we can braze cast iron successfully brings us work that cannot be done in other shops. And this always adds new customers, which every smith is glad to have. We find it difficult to successfully braze in an ordinary blacksmith forge, for the reason that the greater heat will be on the under side of the castings while it should be on top. It is also difficult to keep the fire as clean as it should be, while with a gasoline brazing forge the fire is always clean, and one can see just what he is doing and there is no danger of burning or melting the casting.

There are a great many things about brazing cast iron, that can only be learned by experience, but almost anyone can braze successfully with a brazing forge, after he has done a few jobs. One more great advantage that a brazing forge has over a blacksmith forge is that you can lay the casting in the forge and braze without moving it until again cool. Consequently there is little danger of the parts being moved out of shape. We use from 30 to 40 pounds of brazing spelter a year. This costs us about 20 cents per pound, and we think it far better than all the fake brazing

compounds on the market. Some brazing compounds are, however, very good while many are no better than common borax and spelter.

Our work is principally in the machine shop line. Consequently we have a great deal of flue work for threshing engines, tipping flues, and all tips are brazed on, making a much neater and better job than could be done by welding in a blacksmith forge. After getting the flues and tips ready two men have brazed 48, 2½-inch flues in 1 hour and 40 minutes, and when tested not one leaked.

We hope this information will help some brother smith, and will gladly give any further information if it will be of help to some brother.



It is sometimes necessary to heat only portions of small tools and pieces of metal for hardening, and while this kink may be known to many, others will be interested to know that if the part not to be heated is inserted in a raw potato or covered with damp clay, the heating can be very easily performed. W. B.

A receipt for tempering, which I find the best I have ever had if steel is worked right is as follows: 4 pounds, fine salt, 1 pound saltpetre, 1 pound alum, 1 pound sal soda, 1 pound sulphate of copper and 10 gallons water. There is no danger of its cracking, unless it is a poor steel such as is sometimes used for small drop and hammer dies, then have your solution warm and as soon as you feel your steel stop trembling in the water, plunge it in a can of oil and let it stay until cool. S. A.

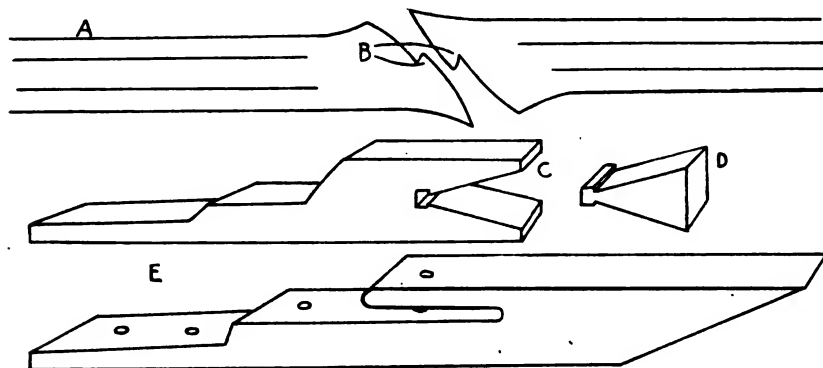
### A Practical Talk on the Welding of Steel.

J. C. LAMON.

In welding steel, the nature of the work decides the kind of scarf to make whether it is to be V shaped, lap or dove tail. To weld chill and chandler

steels the male and female scarf is generally used. But when one has much welding to do it is best to use the scarf A shown in the engraving, as it is quicker and is just as strong if properly done.

On large forgings such as dipper teeth for steam shovels and dredges, a scarf is generally made as at C and D. This is called the "dove tail" scarf. The reason it is made this way is because the steel D will jump



THE NATURE OF THE WORK DECIDES THE KIND OF SCARF.

The fire also plays an important part in welding steel, in fact if you have a bad fire, poor results may be expected. Where there is a large amount of welding to do on small steels, build a fire this way; using "slack" coal and after wetting it good, place a block of wood 5 inches square, and about 15 inches long end up on the tuyere, then pack the coal around the block, making a good wall on each side. Now withdraw the block, start the fire in the hole, using soft coke made at your fire. Building the fire this way concentrates the heat in a small area, and makes a good clean heat. Keep the walls of coal wet and you can make several welds without having to rebuild the fire. Have a spoon, to distribute welding compound in the "heat." (The best compound is one which contains soft iron. There are several very good brands advertised in THE AMERICAN BLACKSMITH). Now after the scarf is made, place in the fire and when near a white heat apply plenty of compound. Never remove the steel from the fire to apply compound, but put in on the fire with the spoon. Now when hot enough, strike the steel on the end. If male and female scarf is used this welds it in the fire. Now take and work down on anvil—blacksmiths here in the "Stone Belt" seldom take the second heat on a steel. They generally use the scarf A. This is made in the usual way, only on each lap a notch is cut with a hot cutter as at B. The sharp points on the scarf made by the hot cutter readily engage thereby preventing the laps from slipping apart, when the weld is made.

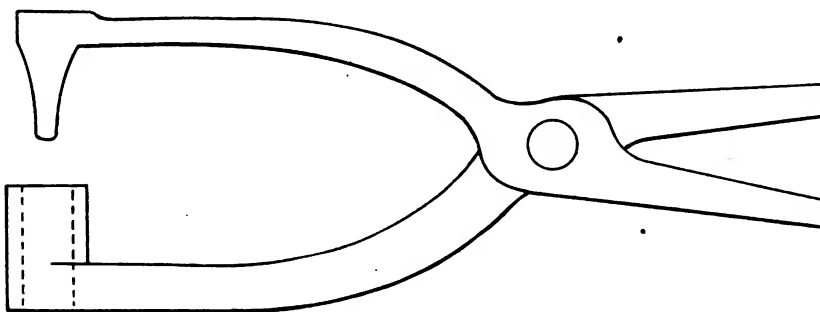
out when the hammer strikes it unless it is forged as shown.

One danger to guard against in welding steel is over heating. Use plenty of compound, be careful in heating and you will have good success. When the weld is finished, heat as if you were going to temper and allow weld to cool slowly. This allows the steel to return to its normal condition. The engravings C and E show a tooth forged from a solid billet. There are other methods of forging a tooth, but this shows a practical method of welding in the steel no matter what methods of forging are used.

#### A Handy Tool for Punching Broken Rivets out of Bow-Sockets.

W. A. SHORT.

I have a simple tool that is very handy and thinking that your readers may perhaps have need of one I will attempt to describe it. I find few



A SHARP QUICK BLOW ON THE UPPER JAW WILL DRIVE THE RIVET OUT.

smiths know anything about a tool such as this. In forging this punch, proceed the same as for an ordinary pair of tongs, leaving sufficient stock for the jaws so that when finished

there will be a space of two inches between the punch and the throat or the jaws. The points of the jaws as finished as shown in the engraving, the punch on the upper jaw being  $\frac{1}{2}$  of an inch in diameter while the hole in the lower jaw is  $\frac{1}{4}$  of an inch. The punch is so gauged as to punch directly in the center of the hole in the lower jaw, in other words the end or point of the upper jaw should come directly over the center of the hole in the lower jaw. The lower jaw or the one containing the hole should bear sufficient stock to strongly re-enforce the hole.

To use the punch place the head of the rivet to be punched in the hole of the lower jaw and close the punch until the point of the upper jaw rests upon the end of the rivet. Now strike the upper jaw with a light hammer and the rivet will fly out. One quick, sharp blow is usually sufficient.

#### Dont's for the Craft.—3. For the Toolsmith. "O'TOOLE."

- Don't overheat steel.
- Don't heat a lead bath too hot.
- Don't heat your steel unevenly.
- Don't hammer steel at a black heat.
- Don't hurry any part of your work.
- Don't strike light pieces too heavy.
- Don't overheat steel when annealing.
- Don't let your piece "soak" in the fire.
- Don't try to heat steel in a shallow fire.
- Don't hammer steel after the red has left it.
- Don't nick steel with a chisel and then break it.
- Don't heat your steel any longer than necessary.
- Don't forget that care never spoils a piece of steel.
- Don't use extremely cold baths

when hardening.

Don't allow steel to cool off directly after forging.

Don't forget that a clean fire is essential to good work.



Don't be afraid to deliver heavy blows on a large piece.

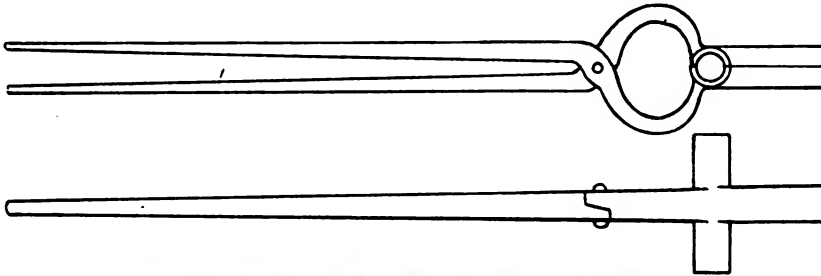
Don't allow the air-blast to strike the piece when heating.

Don't as a general thing, dip red-hot steel in a water bath.

without making sure it is hard. A sharp file will tell you.

Don't forget to remove your steel from the fire as soon as the required heat has been obtained.

Don't heat your piece a little too



UNEXCELLED FOR HANDLING T'S, KING BOLTS AND PINS.

Don't argue with an expert unless you're an expert yourself.

Don't ever think for one second that you know all about steel.

Don't think of anything but the work in hand when working steel.

Don't forget that heating softens steel and that cooling hardens it.

Don't forget that charcoal is best for fuel in connection with steel.

Don't hammer on the edge of a flat tool during the finishing heats.

Don't forget that a forging heat is too high for annealing or hardening.

hot and then allow it to cool to the proper (?) temperature.

Don't forget that heating is the most important operation of all to which steel is subjected.

Don't fail to reheat your piece to a bright red, after forging, and then allow it to cool in a dry place.

Don't think because you have held a piece of steel in the fire and plunged it into water that you are an expert tool smith.

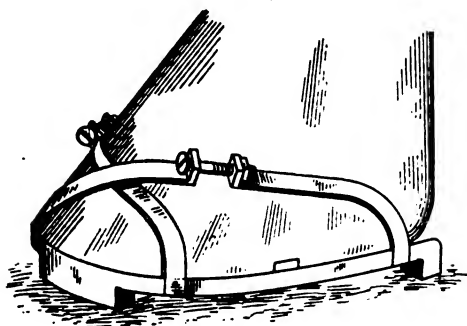
Don't condemn a certain brand of steel unless you have thoroughly tested it and even then be careful what you say.

The engraving shows plainly how the shoe is constructed and attached. The only tool necessary to attach this shoe is a screw driver with which to turn the screws which pulls the straps tight. These straps are level with the outer edge of the shoe so the horse cannot cut himself. The smith in attaching the shoe cuts a crease in the wall of the hoof to let the strap in for about half an inch up from the shoe. This prevents the shoe from slipping.

### A General Shop of Missouri.

F. J. SCHMIDT.

The accompanying engraving is a plan of the first floor of my shop. A and B, represent forges; C and D, the anvils; E, the drill press; F, the emery stand; G, the cold tire-setter; H, the tire-shrinker; I, a work-bench with two vises; J, the rivet case; K, the horseshoe rack; L, the coal bin; M, the bolt case; N, the iron racks; O, the shoeing floor; P, a 4-horsepower Havana gasoline engine; Q, the wood and iron lathe; R, the boring and tenoning machine; S, a 26-inch band-saw; T, the planer; U, a 300-pound grindstone; V, a work-bench and vise; W, the wood rack; X, is the office and Y, represents the implement room.



A SCREW-DRIVER AND A KNIFE WILL DO THE WORK.

Don't attempt to make a success of steel working without studying steel.

Don't withdraw your piece from the hardening bath until it is thoroughly cool.

Don't ignore the instructions of the expert when he demonstrates a new brand.

Don't forget that self-hardening steel may be made extra hard by cooling in an air blast.

Don't attempt to straighten steel which is to be hardened without heating it red-hot.

Don't forge an expensive tool from a certain brand without being sure as to how "it works."

Don't draw the temper of a tool

### Handy Tongs of Special Design.

WM. CHAMBERS.

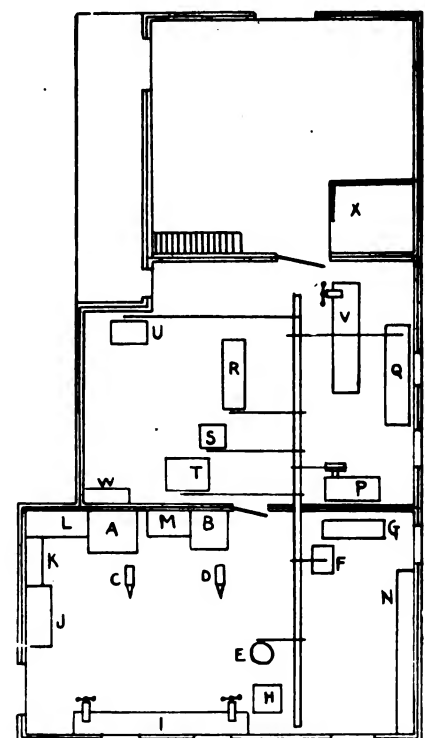
The tongs shown in the engraving are made especially for handling T's, king bolts and bolster pins and for holding round stock while staving up the ends. For these purposes I find them unexcelled and I believe the readers of THE AMERICAN BLACKSMITH will also consider them of extreme value when working on round stock such as bolts and pins.

There is little to be said in regard to forging these tongs except that they are forged similar to the methods employed when making a pair of ordinary bolt tongs.

### Another Nail-less Shoe.

A. H. M'LACHLEN.

In the May issue I noticed the drawing of a nail-less shoe and thought perhaps your readers would be interested in the shoe which I have recently had patented. I studied on the problem of applying shoes to a horse's foot without the aid of nails and finally perfected the device as shown in the engraving. I gave my nail-less device a good fair trial and have now had it patented.



A GOOD EQUIPMENT WILL CARRY THE LOAD.

The stairway in this room leads to the second floor which contains the paint shop, a lumber room and another im-

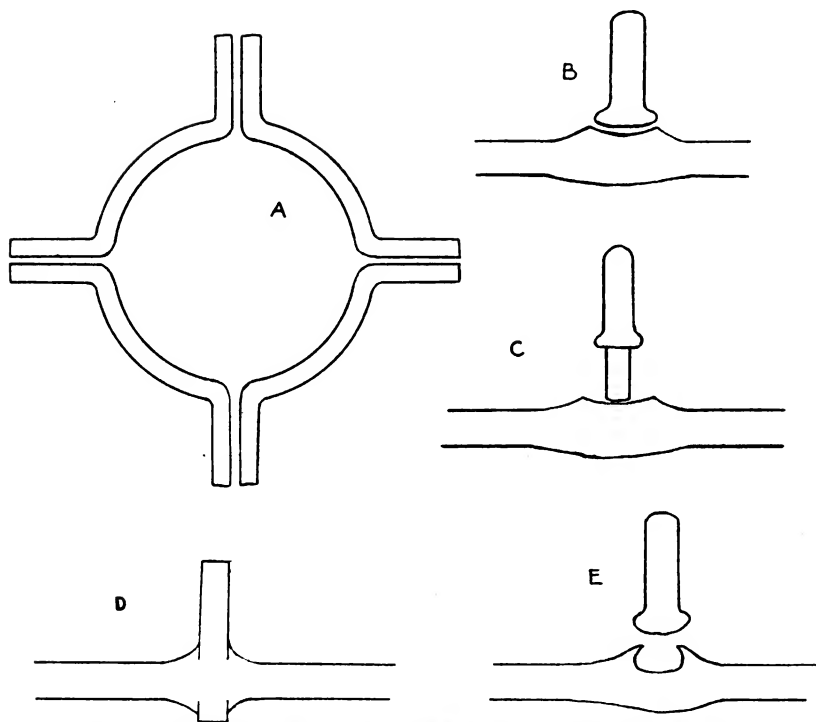


FIG. 1.—THERE ARE MANY METHODS FOR FORGING EYE BANDS.

plement room. The shop is also equipped with an elevator and it saves us much time and hard work in taking wagons, buggies and heavy implements to and from the second floor.

I began here in 1902 in a shop 24 by 28 feet and today my place of business has enlarged to 78 by 40 feet. I never have any time to waste. Have two helpers and myself in the shop and we are always busy. We do all kinds of repair work and build new wagons. There is always work to be found and I believe in working when a man has the opportunity.

#### Forging a Four-Eyed Band.

GEORGE HARNWELL.

The band we are about to make will be, let us say 16 inches in diameter by 4 by  $1\frac{1}{2}$ -inches. Now there are four or five different ways of making this band; one way, and I think a very poor way, is to bend four pieces of flat stock as shown at A, Fig. 1, and then weld them together at the eyes. Then punch and work out the eyes and you have a four eyed band, but not one that would be considered a good job. Another way is to jump your pieces on after upsetting the piece for band as shown at B, Fig. 1. Then again to make a still safer job of the weld you may forge your jump with a pin, punch a hole in the band where it is upset, then with two separate heats jump on your piece over a hole, then with another heat weld the pin on inside of band as shown

at C and D. This method provided you use good heats makes a good solid job. Then again you can take your iron for the band, upset it well at the four places you are going to

put your jumps and then scarf as at E. The jump is now driven while both are hot. Now close down your scarfs, take a good heat (which must be taken very slow, or the outside only will be welded) and weld with fullers in the usual way. There are objections to this way, however: First it takes considerable time to scarf the band, and you cannot be sure of having a good weld no matter how careful you are, as the slag and dirt that would run off if the heats were separate, will settle in the scarfs. And although it is covered up and looking all right the weld may give us lots of trouble before the band is finished. In my estimation two pieces of iron put together in this manner and then welded, very seldom result in a good reliable and sound job.

My method of making an eye-band is as follows: Take iron  $\frac{1}{4}$  of an inch thicker than the finished band is to be by 4 by  $1\frac{1}{2}$ -inches for this case. Now we require 4 feet 6 inches circumference of our band with 7 inches for each lug. The band will draw 6 inches in making, so 6 feet 6 inches is long enough. Now mark off 6 inches from the end deeply with the

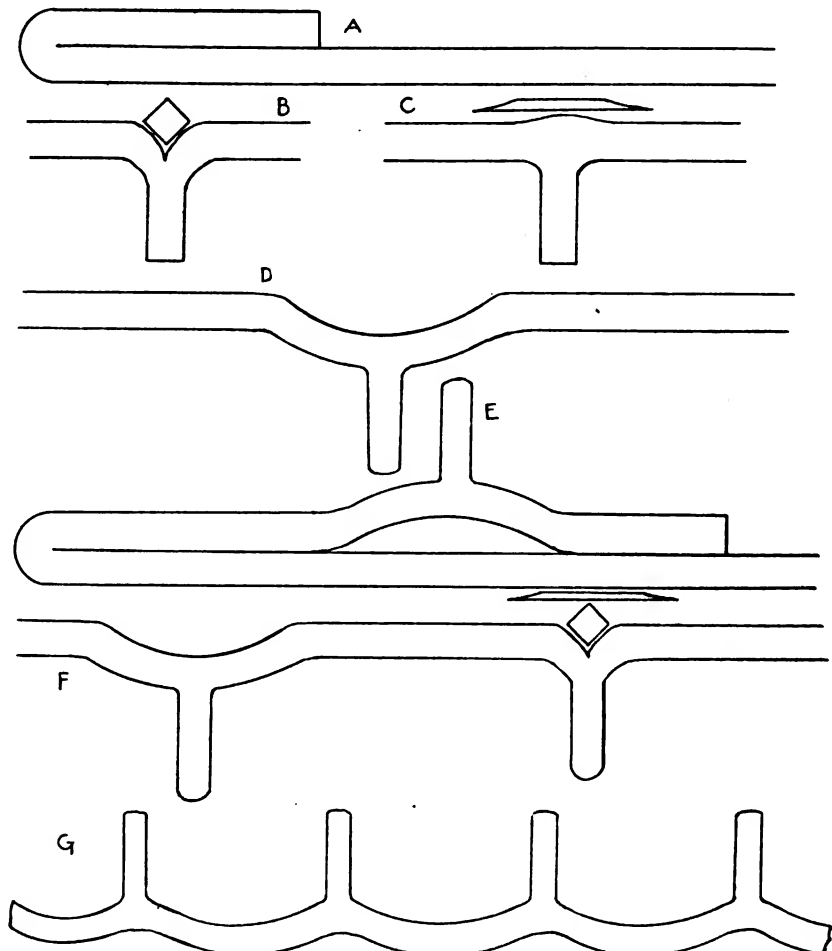


FIG. 2.—BUT THERE IS ONLY ONE BEST METHOD OF DOING THIS WORK.

center punch in the edge of the bar. Then mark  $3\frac{1}{2}$ -inches from that with the chisel. Now heat and cut partly through and double over as at A, Fig. 2. Now weld up to center mark and spread and you have piece like B. The piece of round or square stock is now welded in. Then take

the shortest, bend between lugs, and chamfer. Then weld your band and finish it up by punching the lugs, and working out the eyes with eye-bolt tools. To get the lengths I take a piece of  $\frac{1}{2}$ -inch square stock and bend it to the radius of a band struck out on a piece of sheet iron. Put

the male scarf at the point. This is the case especially with hard steel. The weld may be made very well but there is usually a space at the point of the male scarf which is doctored with a dutchman of iron. I will try to show how to overcome this by forming the scarfs slightly different than is usual. When making the female scarf and after cutting the V drive the chisel into the throat of the cut and form a hollow space to receive the knob which is formed on the male scarf. Now point up the male scarf, fullering the point of it carefully, care being exercised to not get the neck of the point too thin but to govern yourself according to the size of the stock being worked. The two pieces are now driven together, heated and welded with the assurance that it will be impossible for a slip back to occur.

A common method of preventing the pieces from slipping apart is to roughen or notch the faces of the scarfs with a chisel. Of course the smith knows that care must be taken to heat the pieces slowly so as not to burn the lighter parts before the heavier parts are in condition for welding.

THE EDITOR.

### A Short Talk on High Speed Steels.

BY AN EXPERT.

As the progress of steel making develops, particularly the manufacture of the modern high speed steels, it becomes necessary for the successful tool smith to devote some of his spare time to the study of the new steels, their nature and adaptability to the requirements of tool making. Unlike the air hardening steel of a few years ago, the high speed steel of today can be used in innumerable ways in making tools which formerly were made of carbon steels. Its ease of forging, shaping and hardening permits the use of it in the construction of many tools and dies, which could not have been made to advantage from the old-time air hardening tool steels. We not only find it used in the machine shop in the shape of cutting tools, but it has many uses in the press room in the making of forming dies for hollow ware, as wire forming dies, and in the bolt mill we find it used for bolt heading dies on hot work, and for various other work unthought of some years ago. Once thoroughly understanding its usefulness it is difficult to see how we could ever get along entirely without it.

Owing to the different brands of

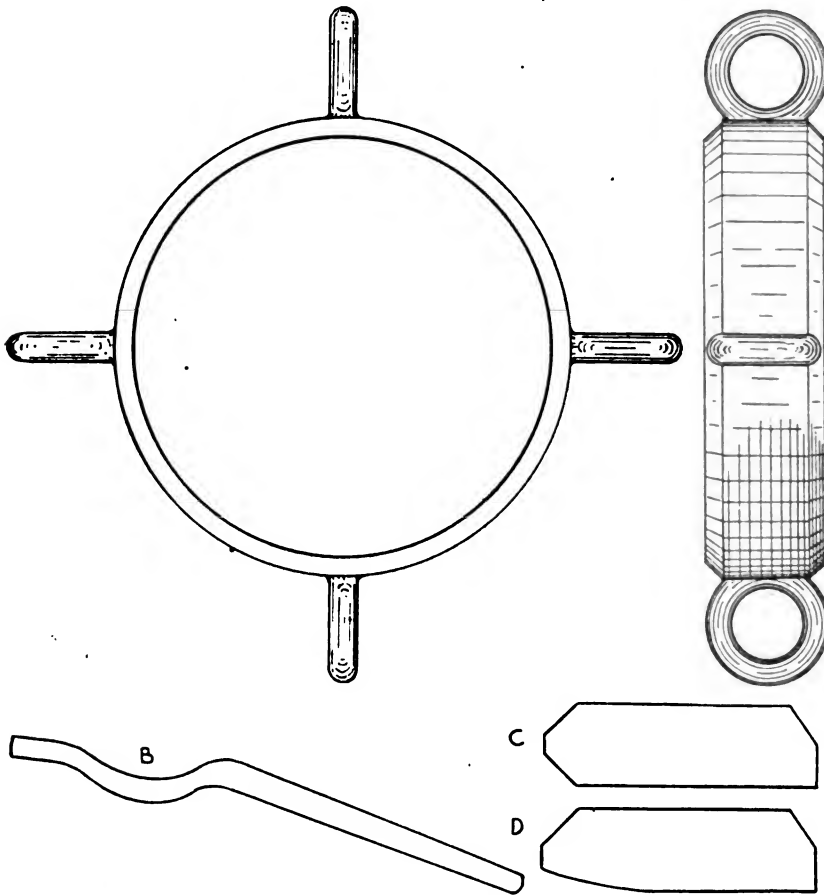


FIG. 3.—THE EYES ARE WORKED OUT WITH EYE-BOLT TOOLS.

a piece of 4 by  $\frac{3}{4}$  by 8-inch stock, taper off at both ends and weld across to cover up all scarfs, C, Fig. 2.

I generally weld this piece at one end and then at the other end on the anvil and then with a good heat (slow on account of cover piece being thin) weld the middle in bolster and at the same time put in bend as shown at D, Fig. 2. Now chamfer the part that is bent and don't forget to chamfer one edge on the inside unless otherwise ordered. Mark off 12-inches from center of lug with center punch and then  $3\frac{1}{2}$ -inches from that with chisel (cut partly through). Double weld over to center mark and proceed as with the first one, see E and F, Fig. 2. Work the other two lugs in the same way measuring from the second to the third and finishing with the fourth. Then you have a piece like G, Fig. 2. Now scarf your first end, which should be

the end of your gauge to the center of the eye on the drawing and then mark the center of the next eye. Leave the gauge long enough to handle then heat it in the center and bend it, as shown at B, Fig. 3. If the band is drawn to this before the final bending is done it will save trouble.

I will endeavor to show how a band should be chamfered on the inside so it will drive easily whether put on hot or cold, see C and D, Fig. 3. If chamfered as at C, it will ride over the wood, but chamfered as at D, it will slide on easily and be tight.

### The Making of a Split Weld.

G. H.

A great many smiths, when making a split weld are satisfied to form a V and to have the scarfs fit nicely. The result is generally that the first blow from the hammer forces back

high speed steel and their varying composition, no general rule for their working can be adopted. In order to determine the proper forging heat, the tool smith must experiment, and he will find it a good method to test any particular brand by giving a piece of it as much heat as he thinks it will stand. We find that the majority of the new alloy steels used in forging should, if possible, be worked in a block fire with a good body of forge coke making a clear bright fire, then thoroughly heating the steel with a very moderate blast to a full plastic heat; a trifle



THE LEGS TURN OUT SLIGHTLY AT THE HOCKS.

higher than is ordinarily used in forging good carbon steels. By rapid forging and repeated and thorough heating, it will be found no difficult matter to give the steel almost any desired shape. But unlike carbon steel it will not stand to run the heat down, as the steel will most likely be found cracked or split. Heat thoroughly and often, that is the essential point to remember.

In using the steel for lathe, planer, or shaper tools, it is of course unnecessary to anneal them. Let them cool in the air, and when cold, rough grind them. They are then ready for hardening as, in the making of taps, reamers, twist drills, milling cutters or forming dies. It will be necessary to anneal the forging to enable it to be worked in the machine. The different sizes and shapes of this

steel can generally be procured already annealed from the steel maker, but when unable to obtain the annealed bar, and the work is to be annealed, proceed in the following manner: A commonly used and successful method of annealing consists in placing the tool in a wrought iron or cast iron tube, having space large enough in circumference and length to accommodate the work and plenty of packing material. Have one end threaded for a cast iron cap which can be screwed on and off as desired. The other end can be permanently fixed on the tube as it is generally only necessary to use the opening in one end. Have a number of  $\frac{3}{8}$ -inch holes drilled in the tube and also a few in the end caps. The holes in the tube are to act as a vent, and let out the gas which will be generated when the packing material is heated. The end holes can be used for a number of test wires, which can be withdrawn as the heating progresses. By this means it will be able to ascertain the heat desired, which should be a bright orange or a trifle higher if the steel will stand it. When the desired heat is reached, shut off the blast and allow the tube with its contents to cool down. If a furnace is used for heating, allow the tube to remain in the furnace until the furnace and all is cold. If heated in a forge fire and it is necessary to use the forge fire for other work, remove the tube and bury it in dry slacked lime and sawdust, and when cold the steel will be found quite easy to work in the machine. The packing material may be any of several now commonly used, but charred leather and dry, fine smith coal is very effective. Very often we find that the smith coal alone will answer.

#### Another Peculiar Case of Interfering Hind.

E. R. PERRIN.

The animal which forms the subject of this article is a stoutly built cob, a fine mover in harness and good under the saddle, but badly interfering behind while working in harness. He never interferes while being ridden. You can see from his picture, Fig. 1, that he is nicely put up behind except that his legs are slightly twisted outwards from the hocks, with the toes of both hind feet pointing outwards *i. e.*, toe-wide. This, and a very peculiar mode of action, causes him to interfere. He hits both fetlocks hard and frequently. Animals with this conformation of

the hind legs usually travel clear with the insides of the feet high. But the peculiar manner in which this animal picks up his feet makes his case an exception to the general rule.

I had to ride behind this animal to ascertain the cause of the trouble. By so doing I learned that the insides of the hind feet left the ground first and the outside toe last. But just as the foot is about to leave the ground it twists slightly to the outside, thus turning the heel of the foot inwards with the outside toe as a pivot. From this position each foot describes a semi-circle inwards thus striking the opposite fetlock. It then occurred to me that if I could modify this twist



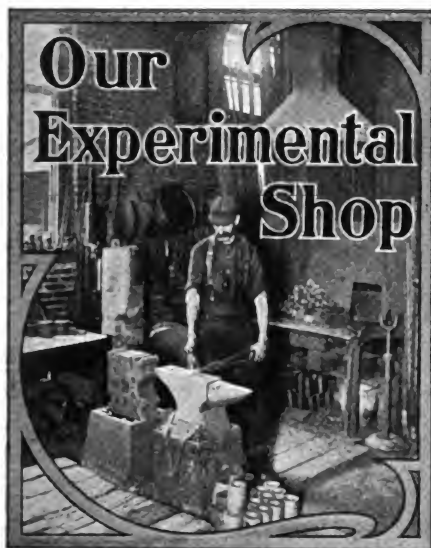
OF RIBBED STEEL WITH LONG SPUR ON THE OUTSIDE.

of the foot, it would oblige the animal to carry his feet more on a direct line. This supposition proved correct. I made first a pair of shoes out of light ribbed steel with blank insides. This plan helped much but did not cure the trouble entirely. I then made him ribbed steel shoes with a long outside spur and calk, see Fig. 2, which prevented the trouble. The outside spur gives him a hold on the ground thus modifying the twist of the foot and thereby obliging him to carry his feet more on a direct line.

You will see by Fig. 1, that he had one shoe off and the other worn out. I would like to have had his picture taken after he was newly shod, but as this was the only convenient time to get the horse and the photographer together, I necessarily had to have his picture taken just as he was.



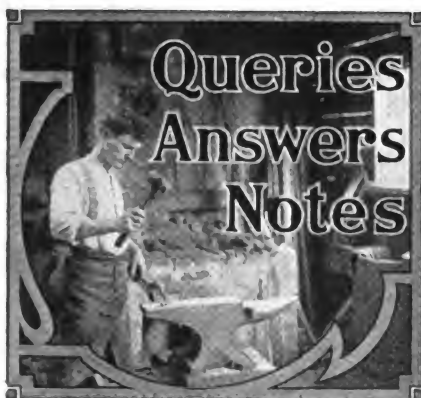
The shoes used in this case are very light. This has much to do with the success of such cases, especially while the hot weather lasts, for many a horse that is difficult to shoe in the summer, will go clear in winter even though indifferently shod.



Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

To blue steel without heating try the following recommended by an expert: Apply nitric acid, and after wiping it off, clean, oil and burnish the piece.

Those smiths pursuing side-lines such as the repairing of delicate and fine machinery will be interested to know that an exceptionally good oil for delicate work is made by placing equal parts of small lead and zinc shavings into olive oil until the oil becomes colorless. The oil must be of the best, however, and sit in a cool place.



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**Wants a Tempering Receipt.**—I would like a good receipt for tempering chisels and drills.

**Mixing Roughstuff.**—Will some brother kindly tell me how to mix roughstuff or

filler? I have been using the paste form but wish to know how to mix up the powder.

FRANK A. HARRIS.

**To Case-Harden.**—I would like to know how to case-harden iron, steel and cast iron. Can some one tell me through THE AMERICAN BLACKSMITH? What is used in case hardening and where can I get it?

HENRY COAD.

**Hub and Hollow Augers.**—Answering Mr. W. H. Tippin: I use an A. A. Woods and Sons adjustable hollow auger and like it better than any other I have ever used. The Little Giant hub auger is best because you can bore a tapering hole with it.

FRANK A. HARRIS.

**A Case of Seedy Toe.**—A customer of mine has a mule with a hollow foot. The wall and the foot have parted and the hole gets full of dirt and consequently gets sore. Can some brother tell me the cause of this and how to cure it? The animal is young and has never had shoes on its feet.

J. E. BROWN.

**That Lame Colt.**—I noticed in the latest paper that some brother smith has trouble with a colt. He says the horse goes lame right after he shoes him. I think he draws the shoes too tight. I have a horse on which I do not draw the shoe at all. If I do, the horse will go lame behind, and you would think she was foundered in front.

GEO. MATHER.

**The Refining Heat.**—Brother Huff wants to know the refining heat of steel. This is a hard question to answer for there is such a wide difference in steel. But I will give the brother a pointer. Get a pine board 8 by 12 inches and put some rosin on it. Now bring your steel to a forging heat and rub it and work it in the rosin. It will improve it.

W. H. K.

**Clay for Fire Pots.**—Will some brother smith tell me through the columns of THE AMERICAN BLACKSMITH what is the best kind of clay to use in lining a blower or a bellows fire-pot? Also how to make it up to keep the fire from cracking and melting it to the dross or clinkers? I have tried several ways of lining both kinds, but had poor results. I have both kinds of forges.

A. B. R.

**Tempering Granite Chisels.**—Make a tempering solution as follows: Dissolve 1 ounce of corrosive sublimate and 4 ounces of sal ammoniac to each gallon of soft water. Dress your chisels and let them cool. Then heat only the part you want tempered, rub in a little prussiate of potash and let it eat only enough to make it take temper. Then plunge in your solution.

EDWARD LARSON.

**Forging and Tempering Butcher Knives.**—If I want to make a butcher knife eight inches long, I take a piece of tool steel  $\frac{1}{4}$ -inch thick by  $\frac{1}{4}$ -inch wide, heat and draw out to shape, then I take a wagon spindle, close the hole at small end with a cork, and then I fill spindle with linseed oil. Then I heat an iron and hold it in oil until it heats the oil, then I take knife, heat it to a bright cherry red, and then plunge it in oil and hold it there until it cools. Wipe it off then take a piece of iron big enough to hold heat until I draw temper, I take my knife and draw it over the iron until it comes to the color I want. I generally draw to a blue. This makes a good knife.

J. H. CLEMENS.

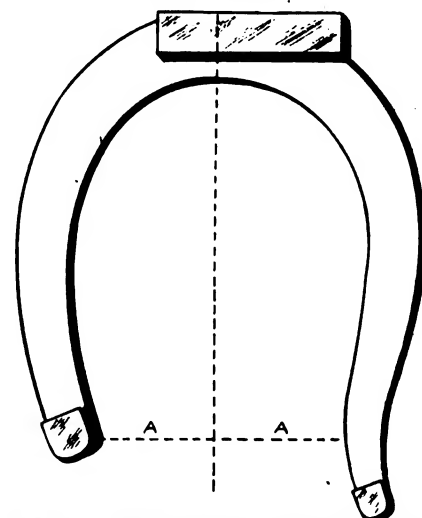
**A Letter from Idaho.**—I am doing a good business here in Idaho. I have three men most all the time, do mostly horseshoeing and got a Barcus horse stock about two weeks ago. I have already had 15 horses in it and must say that I am only sorry I could not get one about 15 years ago. I learned blacksmithing in Germany and worked in a few cities there. I have also worked in Switzerland and in France. I have had much experience in most all branches of smithing, but I am still learning wherever I can. I would like to advise every young smith not to stay at home, but get out in the world and see the different ways, which are used in different places. They are the ones, who will be successful if they keep their eyes open so they will learn. I always like to read your paper and enjoy the discussions.

JACOB BRENNER.

**Tempering Granite Chisels.**—The articles on hardening and tempering steel are worth more than the price of the paper. I have E. R. Markham's books and if any one is going to work steel much, just get all the books you can on steel. In April, is a question on tempering granite chisels: First be sure you have the right kind of steel, say Sanderson's No. 4 or any steel that will harden at a low heat. When making the chisel, heat to a bright red and draw out to the shape you want, but decrease the blows as the steel gets cool. At no time hit the steel harder, when it is cooler. When you have your tool in shape heat to a red and water, hammer it lightly, but not too cold, decreasing your blows all the time. It takes practice. Don't pound the steel edge-ways. When finishing find the lowest heat that your steel will harden at and then be careful never to heat hotter than that to harden it.

S. A.

**A Shoe for a Knee-Knocker.**—The accompanying engraving shows a shoe for Brother Sheldon's knee knocker. I have used it successfully for more than two years. Set the toe square across the foot, making



USED SUCCESSFULLY ON KNEE-KNOCKERS FOR TWO YEARS.

the outside end a slight bit higher than the outside of the shoe and about  $\frac{1}{4}$  of an inch longer. The outside calk should also be a little higher. The sides A, should be the same distance from the center line of the foot, as shown in the engraving.

R. M. WHITE.

**To Shoe a Stumbler.**—I consider E. W. Perrin as the best writer on horse shoeing I have ever read, and I would like to ask him a question, through your paper, in regard to a stumbling horse that I am shoeing. I have shod him with a full roller-motion shoe, and also a four-calk shoe, and have received no results from either one. I have also used a foot leveler. I would be very much pleased to hear from Brother E. W. Perrin on the subject.

SAM S. STOKES.

**To set Planet Junior Sweeps.**—Will some brother smith please tell me the best way to set Planet Junior Sweeps? I have but very few, and they are strange to me. I wish you would give me your best way of setting them to make them plough best and do the nicest work. Do you temper them very much after setting? If so, how hard do you make them? I wish some brother smith would explain the above through the columns of THE AMERICAN BLACKSMITH.

A. B. R.

**Troubled with Corns.**—One of my customers has a horse that has corns on both front feet. I tried a bar shoe on him, but he could not travel with it. Then I welded two calks in, where the last nail holes were, and this seemed to help him quite a bit. But I would like the opinion of the craft as to the best method of shoeing him. This horse was shod by a "Jack-leg" until he could not travel at all. H. B.

**A Peculiar Case.**—Have a horse that is lame in the left hind leg. When it was first noticed she would put her foot back and set it flat on the floor and then set it well front and set it flat. I have been in the business for over 30 years and have never seen a horse do it. There is no swelling and no heat. Will some one kindly give their opinion where the trouble is and if there is any remedy will some one advise.

J. H. HAINES.

**Welding Toe-calks and Setting Plows.**—If Mr. J. Van Tassel will use common fine sand and no borax, the toes will stick nicer. I only lost one toe in over a year to my knowledge. If Mr. C. R. Ellis will invert his plow and lay a straight edge along the bottom of the land side and share, then measure from the point of the beam, setting it so that the distance between the straight edge and the beam measures 16½-inches his plow will surely set correctly as it should.

R. M. WHITE.

**To Shoe a Forger.**—In answer to William Walsh's query on shoeing a forging horse will say, I would use a light driving 10 or 12-ounce shoe, in front, with toe weight made rolling. Widen at toe so when you draw a bevel on the toe of the shoe it will throw the higher part of the toe nearer the center of the foot. The front feet will then break over quicker at the toe. Shoe the hind feet with 7 or 8-ounce side weight shoes with the weights on the outside of the feet. Gradually swell on the inside on a level with the outside calk. Do not shorten the toes of the hind feet but leave them long to give slower motion.

SAMUEL OWENS.

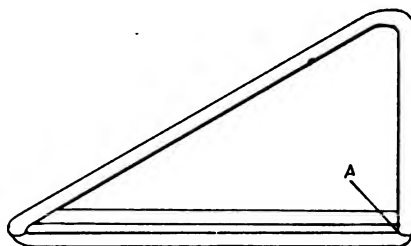
**A Letter from Jersey.**—I am located in the central part of the state in a small country town in a good farming district. I depend on the farmers altogether. I run a repair shop and also do new work. This latter consists mostly of what we call a

farmer's market wagon. I have a nice trade in this line. My shop is 52 by 20 with a machine shop in the rear 38 by 14. I have a 6-horse power gasoline engine (Columbus make) which I am very proud of and can highly recommend. I have a jointer plane, a rip and band saw and am going to put in a power drill soon. If I had to do without power again I would go out of business. FRANK A. HARRIS

**Still more about Apprentices.**—I like that article by Mr. R. E. Stephenson. When I went as an apprentice, I worked one year for nothing and a good many times the boss had me doing farm work, and other work that was in no way connected with blacksmithing. After the first year, I worked three months for \$36, and then for \$1 per day. That lasted about three weeks when work got slack and then, of course, I had to lay off. That rather discouraged me, so I thought I would run a shop of my own. I tried this in a little town, and soon starved out. There were shops all around me that had power, and I could not compete with them. I sold my tools to a farmer, and went to work in a big shop, where I found out that I did not know very much about blacksmithing. I then began studying, and am now beginning to get wise to some things. I am going to start in again, this time with power and I am going to stay with it.

R. J. HARMAN.

**A Drilling Question—A Plow Holder.**—Will Mr. L. R. Swartz or some other brother tell how to repair a pair of jars that carry a 3½-inch drill bar that is broken close to the shoulder? I have been told that they could not be made to stand after welding, and the only way to fix them was to put a plate over the break, which we did. In return for this will send description of a plow holder we use. I never saw but one before, and I like it better than tongs. It is made as follows: Take



PLACE IT ON THE UNDERSIDE OF SHARE.

a piece of ½ or ¾-inch square iron, twice as long as the longest share at the mold board joint. Double in the middle at A, close enough to take a plow bolt. Take a piece of ½-inch rod and weld to form triangle as shown in the engraving. Keep two plow bolts in holder to bolt share on with. Place your holder on the underside of your share close to the bar and go to work.

BYRON MARKHAM.

**From Indian Territory.**—I suppose a few lines from Indian Territory are in order. Work has been very good here and I have all I can do with the assistance of a helper. As this is not a cold climate we get all kinds of work the year round. Our prices are moderately low and are as follows:

Horse shoeing, plain.....	\$1.00
Horse shoeing, toed.....	1.50
Horse shoeing, resetting.....	.60
Plow shares-per inch.....	.20
Plow shares, sharpening.....	.10 to .15
Cotton sweeps, sharpening.....	.10 to .20
Wagon axle.....	3.00
Resetting tires, wagon.....	2.00
Resetting tires, buggy.....	3.00
Bolster, all new.....	1.75

From these you can see how prices run here. I work on wagons at odd times and this winter built a log wagon. I have two more to build this summer for farmer customers.

C. S. BLISS.

**On the Setting of Plow Beams.**—In regard to setting plow beams, if you want the plow to run level, set the beam level. That is the same at the front end as at the helm. Set the plow on a straight board and measure the height to top of helm 16 or 17 inches, and let the end of the beam be the same.

The idea of a stifle shoe is to force the horse to put his weight on the stifled limb. The stifled joint is bound to go in place, when he puts his weight on it. The shoe, however, hurts him worse than the stifle. Take any old shoe that is strong enough to hold the cross piece, that is to be welded on. The stock to make this should be about ¼-inch by ½ of an inch. Bend the shoe and turn up the end to fit on side of shoe, about the middle. Before welding it get another shoe same size, and weld end in the above. This is welded to the toe of shoe. The cross bar must be bent to a half circle so it will be 2½-inches high when welded on shoe. D. E. GUDGELL.

**To Stop Forging.**—In reply to William Walsh, how to stop a horse from forging, would tell him he has a hard job on his hands, but there is a way to get over it. If he has done all he can, we would be pleased to help him. Shoe the horse light in front and heavy behind. Use about a 6-ounce shoe in front, and roll the shoe and foot so as to make him break over quicker in front. After dressing the foot let the heel stand and roll the shoe and foot. Now dress hind feet, all off the heel, that he will bear, and leave the toe long. Shoe with about a 16-ounce side weight with a long outside and a short inside, and put a little toe on the shoe; about ¾ of an inch. Some times this will stop a horse, but not all. Before he tries this way of shoeing, try and shoe him with a 16-ounce in front and 6 or 8-ounce behind, and if it don't help him, then let him try what I have said. I do not believe in tapering away the foot if I can help it. Sometimes a horse's forging is because his head is too high or too low. The front part of a horse's body is steadied by his head. So check him up or down and see how he goes.

HARRY GOMMOLL.

**That Stock Cutting Question.**—In the April number Mr. H. H. Smith speaks about cutting bar iron to make a ring any desired size. Having learned the machine blacksmithing trade and also having served some time at boiler making and then learning coach smithing I feel competent to talk on this subject. In machine work it is necessary to know how to cut a bar of iron for rings of various sizes of shafting, etc. The proper way to measure is as follows: 3 times the diameter, plus 3 times the thickness of the iron

plus  $\frac{1}{4}$ -inch to each foot and allow  $\frac{1}{4}$  the thickness for welding.

Should you make a large ring say 3 or 5 feet in diameter, you would run short if the  $\frac{1}{4}$ -inch to each foot were not added. For example; if you wish to make a ring 5 feet in diameter of 1-inch iron you measure as follows: 3 times the diameter (5 feet) equals 15 feet; 3 times the thickness (1 inch) equals 3 inches;  $\frac{1}{4}$ -inch to each foot equal  $7\frac{1}{2}$  inches;  $\frac{1}{4}$  the thickness for weld equals  $\frac{1}{4}$  of an inch. The total length of stock required is therefore 15 feet + 3 inches +  $7\frac{1}{2}$  inches +  $\frac{1}{4}$ -inch equals 15 feet 10 $\frac{1}{4}$  in. This is absolutely correct. JAMES A. KLEES.

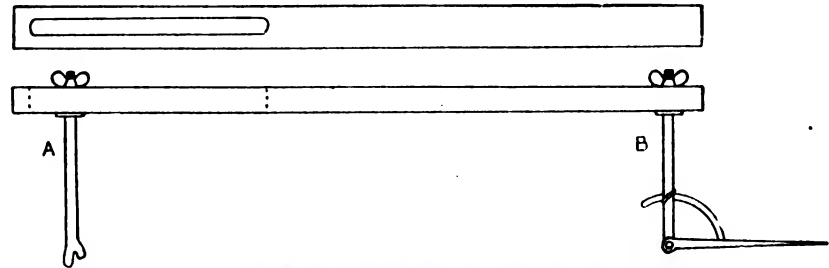
**That Credit Question.**—In the issue of THE AMERICAN BLACKSMITH I find an article by a brother chap who complains about the credit system. He is right. If all good smiths could be brought together and form a combination, there may be something done. But as this brother says, there are too many "botch" smiths, who don't deserve the name of blacksmith, who undersell the honest smith who is supposed to make a living for himself and family.

I have been in the trade since 1862 and have now run a shop for myself for nearly 30 years and can talk from experience. If we did as in the Old Country—require a man to pass a thorough examination before being allowed to become a master—we would achieve something. But here, if a party can start a fire and has burned his fingers a few times on a hot iron, he is called a blacksmith. As long as this condition exists there is no hope for us. I am willing to put my shoulder to the wheel and push things in the right direction. I am 58 years of age but will certainly not drop my hammer for any of these so-called smiths. JAS. WERNER, JR.

**Tempering an Anvil.**—To temper an anvil, will say, first fit two porter bars to the square holes in the waist of the anvil to lift it with and bend the fitted ends at a point six inches from the end. Put a bushel or so of coal on the fire and char it. Do this if you have no coke. Now get a tub or barrel large enough to let the anvil in face down while it is being hardened and fill it within three inches of the top with clean water. Put anvil in the fire face down and heat it very slowly, moving it forward and back until red hot. Then take it out of the fire and sprinkle on the face a mixture of equal part of table salt and chloride of potash. While this is being done have your fire fixed over and have a good body of fire over the tuyere iron. Then return the anvil to the fire and bring the heat up slowly and evenly the whole length of the face to a cherry red. Then lift anvil and quickly brush the face with an old broom, and put it in the tub. Let it hang by the porterbars, resting on the edges of the tub or barrel. See B in the engravings. Take your forge shovel and stir the water gently about the face while the helper pours cold water into the tub at the sides of the anvil, the hot water passing out through the two pieces of pipe into the pails on the floor. When cool, remove the anvil from the water and brighten the face with an emery brick or a piece of emery cloth. FARNHAM.

**A Shop-made Axle Gauge.**—I submit

the accompanying engraving and explanation of a shop-made axle-gauge for the benefit of Mr. Carl G. Weichmann. It is easily made and inexpensive. Take a 1 by 1 $\frac{1}{2}$ -inch piece of hardwood of the desired length and cut a slotted hole in one end to admit the end of bar A. This bar is forked at one end, threaded at the other end with a washer welded on at the bottom end of the thread. The thumb screw allows this rod to be shifted for different lengths of axles. The rod B, at the opposite end of the piece of wood is made as follows: Take an old buggy top hinge, cut it off and weld it on to a piece of  $\frac{1}{4}$  by 1-inch stock. Now put a thread at the upper end of this arm, welding on a washer or shoulder as on rod A. The jointed end is now made like a pair of dividers as shown, so as to allow for adjustment for different angles. In using this tool set rod A, on the spindle up against the collar and the other end on the other spindle. When the axle is set just right mark the sliding bar at the thumb screw. Then get the



IT IS EASILY MADE AND INEXPENSIVE.

gather and mark it on the other side. This will answer for any other axle with the same dish of wheel and will save you much time. HENRY EICHMANN.

**A Smith of Necessity.**—I became a smith by necessity. Seven years ago my father died, and being a poor man, having a mother, sister, and brother to support, I went to work for the smith. I did not know anything about the trade but I determined to learn it if possible. I worked about 15 months, when the smith quit the shop and left me to run it. I worked by myself three months, but got discouraged. But I soon thought the matter over and I decided to buy his shop and tools, and did so, going in debt for same, and at this time I took a man in with me on halves. He worked with me a little over one year and quit. By this time I knew a little more about the trade, and I didn't care so much. I also thought I could make a little more by myself than I could with a partner. I now began to work harder and to build up a good trade. Now I own the shop and tools and have added \$150 worth of new tools. I also built and now have a shop 20 by 38 feet.

I read quite a good deal in the paper of self made men, and I will say this much in regard to it. Now don't understand me to say a man can learn everything by himself, but I will say this much that I never learned to make a weld on steel or iron until I took hold of the hammer myself. A man may get ideas on how to do different work by watching other men, but he cannot do it until he takes

hold himself. That is what I did. I am not afraid to take hold of any work that comes in at a general repair shop. It takes a man that is determined, to accomplish anything. J. H. CLEMENS.

**Still more on Tire Setting.**—My method of setting a tire is as follows: I knock off the tire, drive a wedge in a joint of the wheel, measure the wheel with the tire-wheel and mark the exact size of the wheel. I next measure the tire and shrink it so that it will measure the same size as the wheel when the tire has one heat in it. This will give enough draw for heavy or light tires. On wagon wheels I leave a space between the joint of from  $\frac{1}{4}$  to  $\frac{1}{2}$  of an inch, and in buggy wheels a space about the thickness of a saw blade. Now heat the tire and put it on and while cooling drive directly on the tire over the ends of the spokes, the object being to get the spokes up tight in the hub so as not to dish. The tires will stay absolutely tight under this treatment. For this work we get \$4.00 per set for 3-inch tires and \$2.00 for 1 $\frac{1}{2}$ -inch tires,

while for buggy tires we get from \$2.50 to \$3.00.

When respoking buggy wheels I reset the spokes dry (without glue). My reason for so doing is because of a job I set in glue some time ago and the spokes worked loose in less than a week. I then reset the spokes without glue and they are as tight today as ever—that was eight years ago. I reset a set of wagon wheels 7 years ago without dish and they are tight today and the wheels haven't dished. Wagon spokes when dished are bent at the tenon in the hub. I square the shoulders on the tenons and plane the tenon level on the front of the spoke and make a wedge to put in the back of the spoke. This wedge is thicker at the bottom than at the top. This will straighten the spokes and make them tight. I do all kinds of blacksmithing and wagon work and as a side line I make corn huskers. This gives me a fair income and profit. HENRY COAD.

**With Hammer and Tongs.**—Among the things in the April number, I notice that Carl G. Weichman would have Mr. Chunn tell him how to do better in his methods of painting and I suppose also his prices. Concerning his prices I should think he could easily do better than painting a phaeton—burning off the old paint, giving it 7 coats of priming, rough stuff etc., and 3 coats of varnish—for \$7.75. I am not surprised that his paint shop does not pay. If he keeps a "strict" account of all the departments of his business I wonder why he does not pass up the painting to those who know how to charge for it. Think of it! Seven dollars and

seventy-five cents for a \$15.00 job.

Mr. W. A. Palmer's "hard one" on page 151 in the May number is too easy. He will think so himself when he has been in that factory a while longer. When I worked in the factories and we had axles to set for wheels of certain dish (though we never knew what the dish was to be, nor likewise did the man who set the tire), we did the work by pattern. It is so done to this day. The man who sets axles has a pattern to work by, and is expected to do nothing else. Setting axles in a factory is the easiest job in the business. I have put on 32 sets of buggy tires in one day, and I am free to say that I never was certain of the dish any wheel would have until the tire was almost cold. Now mark you, these tires were taken straight out of the bundle, bent, welded and put on. One helper only. I had that job down so fine that by simply rolling my wheel on a set of tires as they lay on the floor I could cut them off, bend and weld and put them on without further measuring, and would not miss one in a hundred. I would lay out about 20 sets of hind tires, roll a hind wheel over them, once on each outside tire, mark and drawing a line across from one mark to the other would thus mark all where they were to be cut off. Same with the front tire. When the first bunch was nearly all on and while my helper was running probably the last set around in the fire and putting them on, I would get out about ten more sets and have all ready, for cutting, bending, and welding by the time he had his last tire on. This is somewhat retrospective and reminiscent and carries me away from Mr. Palmer.

Now about welding those 9, 10, and

inches thick, and bore holes in it as shown at A. Cut out as per dotted lines to distinguish one side from the other and to allow for drop axles. Make thumb screws as at B, and insert where they ought to be as at C. Have heads of screws edge across gauge. The flat head screws are to fit inside back of collars, the sharp heads on spindle. Set a single axle true by the wheels, setting your gauge by the first one and set other axles (of same taper) by the gauge so set. The screws can be let in or out to suit other axles.

Mr. C. R. Ellis: Why don't you say what sort of plow you have in mind?

Mr. John Bragley: Where you have not a fireplace (fire pot) big enough to weld your 6 to 10-inch wide tire it would be well to weld in 2 heats— $\frac{1}{2}$  the width at a heat. That for the longer tire. For the 6-inch tire, which is  $\frac{1}{2}$ -inch thick, you ought to be able to do it in an ordinary fire. If, however, you cannot get the middle welded while the sides are being done, you can punch a half-inch hole in the unwelded part and take your welding heat without trouble, the hole allowing the blast to heat the center.

To Mr. I. Van Tassel: How to weld an axle broken off square at collar, etc. I never knew a good mechanic to try it. It cannot be done without ruining collar and shortening spindle, which to again get the length must be stretched to weakness and nasty appearance. The proper way to weld on that spindle is to throw it away and put on a new arm. Your toe calks don't weld because you don't get the right heat and don't use the swage. A swage will spread the part of the toe joining the shoe, thus making a lap that cannot help being welded, if your heat

One fellow recommending a certain cold tire setter to carriage men says: "When the spoke projects above the rim in a buggy wheel all that is necessary is to strike the tire a sharp blow above the spoke and the projecting end will be staved down into the rim." This is all "bosh," as any carriage maker's apprentice of two years experience can tell you. Hillick on painting is good. O' H.

## AROUND OUR FORGE FIRE.

"Where's your article on steel by Mr. Markham?" asked Benton looking somewhat anxious.

"His articles have been temporarily discontinued for this month," replied the Editor. "He will be with us again in August." Then picking up the sheets Benton had dropped the Editor continued. "What do you think of that eye-band-forging article on page 194? There are a number of ways of making those bands but this article covers the subject pretty well. Then there's that brazing article on page 191, that will solve the problem for a good many of our readers."

"What are those pig-tail twists pictured on one of the first pages," asked Benton with a faint smile?

"Those are scrolls and twists for embellishing ornamental iron-work, and the picture also shows the various steps in their making. That article will be especially interesting and valuable to the smiths working and experimenting along the line of art work. This branch of the craft has really become a side-line with many smiths. We also have a hint for another side-line in that farm-roller article on page 188. Mr. Vedder, the author, is an agriculturist of no mean standing and recommends this form of roller very highly."

"I see you have another talk on automobile work on page 187," said Benton. "That should be a live topic these days."

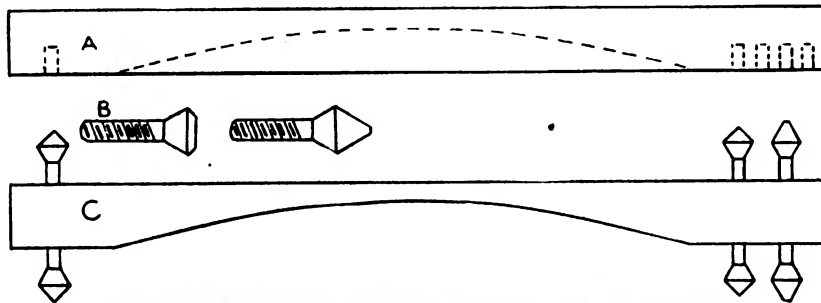
"It is," put in the Editor, "Why do you know, smiths in all sections are beginning to take care of the horseless vehicle and one now and then even going so far as to build a garage."

"But what have you got for the horse-shoer?" demanded the other.

"Why, there's plenty of good matter for the horse-shoer. That article by Mr. E. W. Perrin is a dandy and his articles on the treatment of actual cases is just what the progressive farrier wants. There are a number of shoeing troubles picked to pieces in the 'discussion columns' and the shoers will find something of interest in every article in the book."

"How about future numbers?" asked Benton. "Can you continue to keep up the standard?"

"Keep up the standard?" repeated the Editor somewhat warmly, "Why we're going to improve it. We've got several things on the string now and you can just paste this in your hat, that the paper will be made better and more valuable every month."



THE SCREWS CAN BE TURNED IN OR OUT TO SUIT THE AXLE.

12-inch arms for axles of certain or specified length. Where is there any more trouble in welding one than the other? I don't think it would require the skill of a master mechanic to do either. "Could you do it and hold your job?" This query jingles euphoniously and has the snappy spice of genteel slang, but it is rather vague and undefined. Does he mean that if you could do it, there would be some danger of you losing your job; or if you could not do it, the danger threatened anyway; or if you could not, your job still was in jeopardy?

This axle question leads me to the question of Mr. D. D. Elliott, in the April number on axle gauges, or sets. To make a cheap and good axle set for buggies or carriages, take a piece of seasoned oak or poplar (one is as good as the other) as long as any long axle and 3-inches wide ( $3\frac{1}{2}$  won't be in the way) and 1 $\frac{1}{2}$ -

inches anywhere near right. Don't make or repair any tool that can be bought cheaper. This applies to your question as to how to temper a draw knife. What business have you making a draw knife if you don't know how to temper it? You remind me of a smith writing to these columns telling that he "upset 15 inches of 1-inch square steel to 3-inches," to make a hand hammer. There is no doubt that, that hammer took him all day to make, while he could have bought a much better and neater looking one for 60 cents. I don't admire Norris' Handy Anvil Tool.

I wish to ask S. L. Lord, what he does for a buggy wheel, when the spokes are loose and project above the rim? How does he tighten the spoke or trim the end thereof? His talk on cold tire setting may do for heavy wagon wheels, but you take my word, none of the cold tire setters will do for buggy or carriage repairing.



# BLACKSMITH'S TWIST DRILLS

These drills fit all drill presses taking 1-2 in. or 5-8 in. round shanks. The shanks are flattened or slabbed to allow the set screw of the drill press to grip the drill firmly. Give them a trial, they will

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## Vulcan Horse Nails.



**V**stands for **VULCAN**;  
Powerful and Strong,  
If you use . . . . .

**VULCAN  
Horse Nails**

You Can Never Go Wrong.

THE QUALITY OF VULCAN HORSE  
NAILS IS FULLY GUARANTEED.

**The Fowler Nail Co.**  
SEYMOUR, CONN.  
SOLE MANUFACTURERS.

## WING RUBBER CARRIAGE TIRES

are made from tough, durable, lively New RUBBER. Quality is the first consideration. Our "Wing" Tire will outwear several ordinary rubber tires. The wings (see cut) keep water, sand and grit from working between the channel and the tire, to wear out the tire from underneath. Write for particulars.



**The Goodyear Tire & Rubber Co.,**

Carriage Tire Department,

AKRON, OHIO.

Boston, New York, Buffalo, Chicago, Cincinnati, Detroit,  
St. Louis, Denver, Los Angeles.



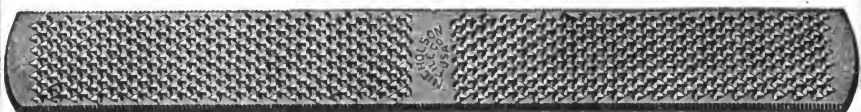
# NICHOLSON FILE COMPANY



PROVIDENCE, R. I.

U. S. A.

MANUFACTURERS OF



## FILES AND RASPS

**Blacksmiths Recommend Our Rasps**

—BECAUSE—

**THEIR WEARING QUALITIES HAVE BEEN PROVEN.**

**Prices Current — Blacksmith Supplies.**

The following quotations are from dealers' stock, Buffalo, N. Y., July 1, 1906, and are subject to change. No variations have taken place since last month's quotations.

All prices, except on the bolts, are per hundred pounds. On bars and flats prices are in bundle lots.

**Bars—Common Iron and Soft Steel.**

1/2 in. round or square; Iron, \$2.80; Steel, \$2.80	
3/4 in. " " " " 2.40 " 2.40	
1 in. " " " " 2.20 " 2.20	

**Flats—Bar and Band.**

1/2 x 1 in. Iron, \$2.40; Steel, \$2.40	
1 x 1 1/2 in. " " 2.80; " 2.80	
3/4 x 1 1/2 in. " " 2.50; " 2.50	

**Norway and Swedish Iron.**

1/2 in. round or square, \$4.90	
3/4 in. " " 4.50	
1 in. " " 4.30	
1 1/4 in. " " 4.80	
1 1/2 in. " " 4.20	

**Horseshoe Iron.**

For No. 1 shoe, 3/4 x 1 1/2 in. \$2.50	
For No. 2 shoe, 3/4 x 1 1/2 in. 2.50	
For No. 3 shoe, 3/4 x 1 1/2 in. 2.50	
For No. 4 shoe, 3/4 x 1 1/2 in. 2.50	

**Toe Calk Steel.**

1/2 x 3/4 in. and larger, \$3.00	
----------------------------------	--

**Spring Steel.**

1/2 to 1 1/2 in. Rounds. Op. Hearth \$3.00, Crucible \$5.00	
1 1/2 to 6 in. by No. 4 gauge to 1/2 in. Flats " 3.00, " 5.00	

**Carriage Bolts. (Net Price per Hundred).**

1/2 x 2 in. \$0.54	3/4 x 2 1/2 in. \$0.82
3/4 x 2 1/2 in. .58	1 x 3 in. .98
1 x 3 in. .62	1 1/4 x 3 1/2 in. 1.81
1 1/4 x 3 1/2 in. .65	1 1/2 x 4 in. 1.70
1 1/2 x 4 in. .75	1 3/4 x 6 in. 2.10

**PATENTS**

Write at once for most liberal offer ever made for obtaining patents and ask for *Inventors' Guide*, the best book published Est. 20 yrs. **W. H. R. MOORE, Wash. D. C.**

**CUMMINGS & EMERSON**

Blacksmith and Wagon Makers' Supplies,

PEORIA, ILL.

## The Campbell Iron Co.

ST. LOUIS, MO.

Carry complete line of Horseshoers' Supplies, Wagon and Carriage Material. WESTERN AGT. FOR DITZLER COLORS IN JAPAN.

Write us your requirements.

### BOLSTER SPRINGS.

Also Wagon Seat, Truck and Platform Springs

Catalogue Free Sold by Leading Jobbers or Write us

**HARVEY SPRING CO.,**  
RACINE JUNCTION, WIS.



### AUTOMATIC YOKE CENTRES

Readily replace broken leather centres. Sold by leading hardware and saddlery jobbers everywhere.

**AUTOMATIC YOKE CO.,**  
Address Desk H, Indianapolis, Ind.

## THE Williams Hardware Co.

Minneapolis, Minn.

Wholesale IRON, STEEL and HEAVY HARDWARE.

CARRIAGE AND WAGON WOODSTOCK.

HORSESHOERS' SUPPLIES.

Send us a Sample Order.

**WANTED AND FOR SALE.**

Want and for sale advertisements, situations and help wanted, twenty-five cents a line. Send cash with order. No charge less than fifty cents

**FOR SALE**—One ten-foot lathe, one 20-in. drill press, one emery grinder.

**CAMPBELL & HENDERSON, Hoopeston, Ill.**

**WANTED**—All around carriage and wagon wood-worker, good on repairs. Steady employment. **A. J. SIMPSON & SONS CO., Omaha, Neb.**

**FOR SALE**—Brick Blacksmith Shop 28x58, gasoline engine, trip hammer and all other machines which are necessary. Fine town, county seat and summer resort. Price \$2,000, half cash.

**HENRY TIETGEN, Detroit, Minnesota.**

**FOR SALE**—Horseshoeing, repair and wood-shop, also house, three lots on corner including stock and tools. Work for two men. Cash business. Time on part. For particulars address **P. O. Box 252, Big Timber, Montana.**

**FOR SALE**—Fine Blacksmith and wagon shop with 7 H. P. gas engine and machines. Large shop, barn, and 5 room house; about 1/2 acre of ground, lots of fruit. Price \$1,000. Very cheap.

**WM. McLANE, R. F. D. No. 1, Kirkwood, Ill.**

**FOR SALE**—Brick blacksmith and wagon shop, 30x80 with complete to 1s and stock for each. Paint shop, 20x20. Plenty of work for two good men year round. Write for particulars.

**DHORITY BROS., Moulton, Iowa.**

**WANTED**—A good, first-class carriage trimmer, also a wheelwright. Must be sober and industrious men. Good wages, fine climate. Business established 14 years. Excellent chance for married men. Address

**JUAN MOHR, Gautamala, Central America.**

**FOR SALE**—Shop rights to make and sell the best patented corn husker on the market. Any blacksmith can easily make them. Very simple, practical and a good seller. Brings fine profits. Parties desiring shop rights or full information write at once to

**HENRY COAD, Alnsworth, Brown Co., Nebr.**

**OHIO BLACKSMITH SHOP FOR SALE**

In city of 10,000 with many lively stables. Shop, house, 2 lots, each 50 by 150. 2 fires, brick forges. Stock and tools for fine business owner is doing. 8 room house. In business 40 years; must retire. \$2800. Blacksmith and wagon shops in many States. Some will exchange.

**HILES & MYERS, A25 Matthews Bldg., Milwaukee, Wis.**

**FOR SALE OR RENT**—Modern up-to-date shop, 50 ft. x 100 ft., two stories high, 10 H. P. Weber engine and complete equipment of tools and machines. Located in prosperous city. Established trade. Guarantee a good man can make over \$2,000 per year above all expenses. Will make easy terms of payment. Owner must retire on account of health. For full particulars address

**FRED LUCAS, Stuttgart, Ark.**

**FOR SALE—FORGE SHOP**—In one of the largest cities of New England. Centrally located, with good line of customers. Building (sheet iron), three forges, one 600 lb. Morgan steam hammer, one 150 lb. trip hammer, one shear, one grinding machine, one tire bender, saw machine, twenty h. p. boiler, ten h. p. engine, tongs and a lot of blacksmith tools. One safe, desk, and other office furniture. Buyer must be an A. I. machine forger. It will be sold on reasonable terms and is a rare chance for the right party. For particulars write, **NEW ENG., care American Blacksmith, Buffalo, N. Y.**

**BLACKSMITH SHOP FOR SALE**—One of the best equipped in Denver, \$1,600 worth of tools and machinery, nearly new, including stock, for \$2,500; shop rent, including a 5-room house, \$25 per month; blacksmith shop 20x75 feet, one story brick; wood shop 23x75 feet, one story brick, with 5-year lease; or will sell all the above with other store buildings, with living rooms above, now rented, bringing in \$100 per month, and the ground the buildings stand on, all for \$18,000, \$8,000 down, balance in ten years' time; all buildings are brick. Address **SHOP OWNER, 1447 S. Broadway, Denver, Col.**

## For Sale - - Foundry.

A first-class modern malleable iron foundry with full equipment. All buildings and machinery in the best condition and ready for operation. Foundry has a large capacity and is ideally located at Columbus, Ohio. Has always enjoyed a flourishing business, but must be sold at once owing to a change in future business of present owner. For full particulars address inquiry to room No. 608 Union National Bank Bldg., Columbus, Ohio.

**FOR SALE**—Blacksmith business in good country town. Work for two men.

**E. WEIGAND, Malvern, Ohio.**

**PATENTS SOLD ON COMMISSION**—To buy or sell a patent write to **E. L. PERKINS, Patent Broker, 66 Broad St., Boston, Mass.**

**PATENTS**

Herbert Jenner, patent attorney and mechanical expert, 608 F. St., Washington, D. C., established 1883. I make an examination free of charge and report if a patent can be had; also the exact cost. Send for circular.

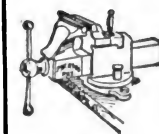
**PATENTS**

Send sketch or model for free examination and report as to patentability. Patents promptly secured. Advice free; terms low; highest references, and best service. Address,

**WATSON E. COLEMAN,**

Registered Patent Attorney, WASHINGTON, D. C.

**\$60** GOES LIKE SIXTY SELLS LIKE SIXTY  
**GASOLINE ENGINES**  
for Pumping, Cream Separator, Churn, Washing Machine, Ice Cream Freezer, etc. Send for catalogue. **GILSON MFG. CO.** Port Washington, Wis.  
39 Park Street.



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ALL SIZES  
FOR ALL USES

LARGEST LINE IN THE WORLD  
ILLUSTRATED CATALOGUE - FREE

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44 BARCLAY ST. New York.



**RUBBER STAMPS  
STEEL STAMPS  
AND STENCILS**

SEND FOR CATALOGUE.

**A. C. GIBSON CO.,**

338-340

WASHINGTON STREET  
BUFFALO, N. Y.

**BLACKSMITH'S FRIEND****TIRE SETTER.**

The only tool that will pull on a heated tire and finish it. Saves the rims, keeps them from splitting, saves time, patience, gives satisfaction and is fully guaranteed. Weighs 15 lbs. with four foot handle. Tire can be heated warm enough on the forge.

**PRICE, \$4.50. Cash with order.**

Mr. Fred Menzel of Petersburg, Mich. says: "I had 4 three-inch tires to set and waited for the new tool to give it a trial and must say it worked fine. Succeeded in welding, heating and putting on tire in twenty minutes with the help of a boy."

Mr. Tinkley is shipping the Blacksmith's Friend tire setter from this station and they must be satisfactory or he would not get the orders he does. Hoping to bill out many more.

**F. G. HADLEY, Agt. B. & O.**

A few more smiths using this tire setter: L. Fisher, Norwalk, O.; Elery Palm, Bellevue, O.; H. Lewis, Houghtonville, O.; Myers Bros., Mansfield, O.; Mr. Rose, Shiloh, O.; J. W. Webb, Plymouth, O.; Wm. Myers, Bellevue, O.; Mr. Hosfelt, Butler, O.

**Bleett's Patent Tugger Iron and Adjustable Fire Pot used in the best shops.**

I am well pleased with your Tugger Iron, and will say it is the best Tugger Iron I have ever used in all my forty odd years of working at the forge. I would not take \$50 for the Iron, provided I could not replace it. The Iron does all you have claimed for it. **GEO. O. GILBERT.**

Send orders to

**GEO. W. TINKEY,**

Richland Co.

Plymouth, O.

# A GUARANTEED HOOF CURE

## Mr. Blacksmith

Would you be interested in learning how to pick up a good many extra dollars in your business with very little extra work? Would you like to increase your business—make it bigger—make more money and make more satisfied customers? You can do it and do it easily with

## O. K. Hoof Remedy

Hundreds of blacksmiths are doing it today and so can you. We want you to sell and recommend O. K. Hoof Remedy to your trade, and this is how we suggest you do it: First, we want you to test it. We want you to KNOW from actual experience what it will do so that you will have confidence in it—so that you will be enthusiastic over its merit. We will stand the risk if it does not do what we claim for it. For example, we offer \$100.00 for any case of Contracted Feet, Corns, Dry, Cracked, Brittle Hoofs, Scratches, Sores, Thrush and Quarter Cracks it fails to cure except in funder when used as directed. We do more—we say to you, and you can say to your customers, back goes your money if it fails. You take no risk. Send 15c for trial can and get our special liberal terms to blacksmiths. We want you to handle this remedy in your locality. You can sell lots of it and make money. Send today and "clinch" the agency.

THE O. K. STOCK FOOD CO.  
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CHICAGO

O.K. HOOF REMEDY  
KEEPS HOOFS O.K.



## Something to Notice.

Instead of being able to use the dies (four to a set for each diameter) for our tools for just the diameter marked on them, one



can thread

"DUPLEX" DIE STOCKS.

two or three besides, because of their wide adjustability, thus covering several over sizes and a little under size.

Manufactured by

## THE HART MFG. CO.

50 Wood Street,  
Cleveland, Ohio, U. S. A.

## YOU JUDGE

Invest in some good books and then judge for yourself if it doesn't pay. Their pages tell you how to do many a difficult job. You can't afford to be without these:

### Forge Practice.

A most valuable treatise upon forge work by John L. Bacon. The book is profusely illustrated and contains chapters on welding, upsetting, drawing out, bending, metallurgy and calculation of stock, also tables and formulas. It has over 250 pages and is very neatly bound in red cloth. Price, \$1.50

### Modern Blacksmithing

is a well illustrated book on general smithing by J. G. Holmstrom, a practical smith. It tells how to make butcher knives, hammers, chisels, plowshares, wrenches, etc. Contains chapters on case hardening, babbitting, drilling and welding. Contains over 200 pages and is handsomely bound in half-leather. Price, \$1.00

### Practical Carriage and Wagon Painting.

A very complete treatise on the painting of vehicles by M. C. Hillick, a master in the art of vehicle painting. The book is just filled with sound, practical information. Fully illustrated and bound in red silk, library cloth. Contains over 150 pages. Price, \$1.00

Any of the above books will be sent postage prepaid upon receipt of price.

**American Blacksmith Co.**  
P. O. Drawer 974. BUFFALO, N. Y.

## BLACKSMITHS' HOOK and HANDLE RULE

Made from hard rolled sheet brass one-tenth in. thick, one and one-sixteenth in. wide, with heavy graduations and figures, graduated from the end in sixteenths of an inch on one side and from the inside of the hook in sixteenths of an inch on the other, adapting them for taking correct measurements from either the outside edge of a hot piece of iron, or from the inside when held against a corner. Graduated twelve inches, have flat handles and measure over all 16 3/4 inches.

Price, postpaid, \$1.15.

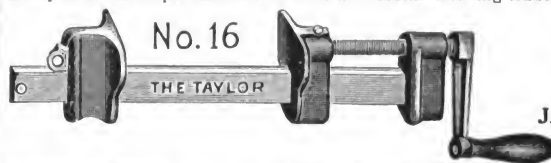
Catalogue of Fine Tools Free.

**THE L. S. STARRETT CO., Athol, Mass.**

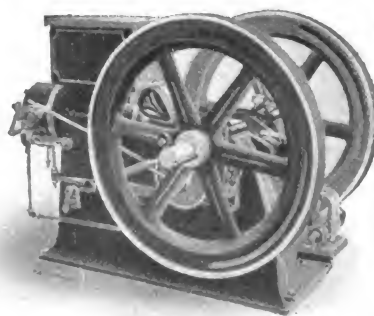
## TAYLOR CLAMPS.

Quick-Acting, Self-Locking.

Every size and shape used in the wood and metal working trades.



Get our Catalogue before placing your next order.  
**JAMES L. TAYLOR MFG. CO.,**  
Bloomfield, N. J.



5 H.P. SPECIAL \$162.50  
**GASOLINE ENGINE**

From Factory Direct to User.

Why pay more money and get an engine of less value? Equipped with mechanical Oilier and Magneto Dynamo. There is none better. Ask for description and liberal offer.

**SPADE ENGINE CO.,**  
Dept. C. VICKSBURG, MICH.

**NATIONAL BLACKSMITH'S DRILL CHUCK**



Made entirely of steel, especially for blacksmithing and carriage work. Positive, strong and self-cleaning. Casts no shadows. Will save cost over other chucks in the saving of time. Money refunded if not as represented. Ask your jobber for it or send direct for prices and circulars. The best is the cheapest. The Oneida National Chuck Co., Oneida, N.Y., U.S.A.

**We Manufacture a Complete Line of CARRIAGE TOPS and TRIMMINGS.**



Illustrated catalogue free. Write to-day.  
**D. A. Laros & Sons,**  
Grinnell, Iowa.

### "The Australasian Coachbuilder & Wheelwright."

A Monthly Illustrated Technical Journal circulating amongst Coachbuilders, Wheelwrights and Blacksmiths throughout the Commonwealth of Australia, New Zealand and South Africa.

Advertising and subscription rates on application to

**J. E. BISHOP & CO.,**  
65 MARKET STREET,  
Sydney, Australia.

#### New Books.

ELECTRICIANS and those having to do with electric wiring and its every day problems will find in *Electric Wiring, Diagrams and Switchboards* by Newton Harrison, E. E., a thoroughly practical work covering the subject in all its branches. The explanations and diagrams are understandable and greatly simplify the subject. The author, who is also Instructor of Electrical Engineering at the Newark Technical School, is especially fitted for a treatise of this character and his treatment of this subject is thoroughly explicit.

#### Trade Notes and Literature.

THE ALWAYS SHARP CALK MFG. CO., formerly of Springfield, Mass., have removed to 34 Essex St., Jersey City, N. J. We are told that in the new plant this firm will be better equipped than ever to turn out the "Always Sharp" calks known to horse-shoers throughout the country.

MR. W. P. WOODSIDE, whose name has appeared in THE AMERICAN BLACKSMITH, as the writer of several articles on the working of steel, has taken a position with The Crucible Steel Company of America, as demonstrator at their branch house in Detroit, Michigan.

THE PARKS BALL BEARING MACHINE CO. are offering to the trade a ball bearing combined circular and band saw with boring and spoke tenoning attachment. This machine is illustrated on page 44. Our readers will appreciate the advantages of this combination and should be interested in getting the descriptive circulars of this company fully describing this machine. A postal card will bring them to you.

IN THIS ISSUE appears the announcement of the Wolfe tire cooler made by M. L. Wolfe & Company, Miamisburg, Ohio. In their advertisement on page 45 is shown two illustrations of this cooler in operation. The machine has many advantages. The trestle can be loosened at any time while the tire is being cooled. The tank is 4 feet 6 inches inside, depth 2 feet and the price is within reach of all.

THE BLACKSMITH'S FRIEND TIRE SET-TER, manufactured by Mr. Geo. W. Tinkey Plymouth, Ohio, is one of the handiest and most valuable shop tools offered to the trade for some time. It is said that this tool will easily pull on a heated tire and finish it, save the rims, keep them from splitting and all around save time and do the work very easily. The price of this tool, \$4.50, is very reasonable.

A COMPLETE CATALOGUE of carriage trimmings, carriage hardware, blacksmiths and wagon builders supplies has been received from the Goshen Buggy Top Company, of Goshen, Ind. The motto of this firm is "Good Goods and Quick Shipment" and this coupled with low prices on a complete line should attract the attention of our readers. If you are in need of supplies of any kind, it should pay you to send an inquiry to the Goshen Buggy Top Company, of Goshen, Ind.

MORGAN & WRIGHT, manufacturers of rubber goods, Chicago, Ill., advise us that their San Francisco branch has been practically restocked and

**Simplicity Engines**

All Sizes  
Get our proposition.  
Western Malleable and Grey Iron  
Manufacturing Co.,  
8-20 Chase St.,  
MILWAUKEE, WIS.



**We Manufacture SHEARS AND PUNCHES**

Hand or power, for shearing and punching plates, bars and angles. Send for Catalogue C.  
**BERTSCH & CO.**  
Cambridge City, Ind.



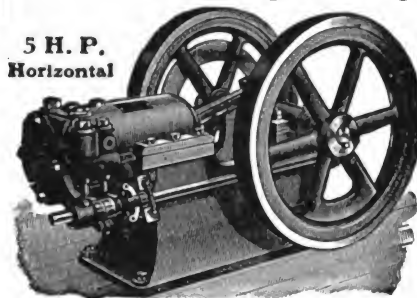
### WHY NOT BUY A CHUCK

That will fit the spindle of your drill press, holding drills  $\frac{3}{8}$  to  $\frac{1}{2}$  in. inclusive, with reducer to  $\frac{3}{4}$  in. Drills held by this chuck are much cheaper than drills with  $\frac{1}{2}$  in. or  $\frac{3}{4}$  in. shank. Simplest and cheapest chuck on the market.

WRITE FOR CATALOGUE AND PRICES

### LITTLE GIANT GAS & GASOLINE ENGINES

5 H. P.  
Horizontal



Size, 1 1/2, 3, 4 1/2 H. P. Vertical.  
6 to 25 H. P. Horizontal.

Either tube igniter or electric igniter. Shipped mounted on skids, if desired for farm use.

Also equipped with pumping attachments. Write for booklet describing full line New Era Gas Engines from 8 to 100 H. P. Special inducements to dealers as agents.

### THE NEW ERA GAS ENGINE CO.

No. 63 Dale Ave., DAYTON, OHIO.

**HIGH-GRADE BUGGIES**  
**\$47.50 AND UP.**  
Dealers Only.



Strictly First-Class Material.

**JAMES & MEYER BUGGY CO.**  
Write for Catalog and Prices. Lawrenceburg, Ind.

**SPAVINOFF CURES**



Spavin, Ringbone, Grease Heel, Sweeney, Windgall, Enlargements, Curb, Galls, Sores, Pollevis, Scratches, Shoe Bolls, &c. Removes unnatural growths and lameness, leaving flesh smooth and clean. Testimonials. CHURCH BROS., AFTON, N. Y.  
\$1.00 per Box, by Mail. FOR HORSES AND CATTLE.



**DETROIT TWIST DRILL CO.**  
228 21st Street, Detroit, Mich.

that they are in a position to take best of care of their Coast customers. The permanent address of this firm in San Francisco will be 411-413 Golden Gate Ave.

We are also advised that Morgan and Wright have arranged with the Auto Tire Co., of Kansas City, for the handling of their automobile tires.

A RELIABLE FIVE H. P. ENGINE FOR \$150. So reads the advertisement of the Cascaden-Vaughan Co., Waterloo, Iowa. The engines built by this company are said to be designed especially for the blacksmith trade, made in all sizes from 1 1/2 to 30 H. P. They start easily and have no complicated parts to get out of order. Sold under a positive guarantee. Write for free catalogue of engines, threshing machines and hay machinery.

A NEW LINE of "Little Giant" gas and gasoline engines has been put on the market by The New Era Gas Engine Co., Dayton, Ohio. For over six years this engine has been sold in one size only, 5 H. P., strongly built to stand severe service. The Manufacturers advise that the engine gave such good satisfaction that they have decided to build the "Little Giant" in all sizes from 1 1/2 H. P. to 20 H. P. A completely illustrated catalogue has just been issued by this firm. Readers would do well to write for a copy.

"EXTRACTS FROM OUR DAILY MAIL" is the name given to a folder of testimonials received from the Western Malleable & Grey Iron Mfg. Co., of Milwaukee, Wis. The testimony of users is the highest endorsement an engine can receive and the large number of unsolicited letters praising the SIMPLICITY certainly speaks well for this engine. We are told that the Western Malleable & Grey Iron Mfg. Co. are selling a large number of machines to American Blacksmith readers and every one installed gives good satisfaction.

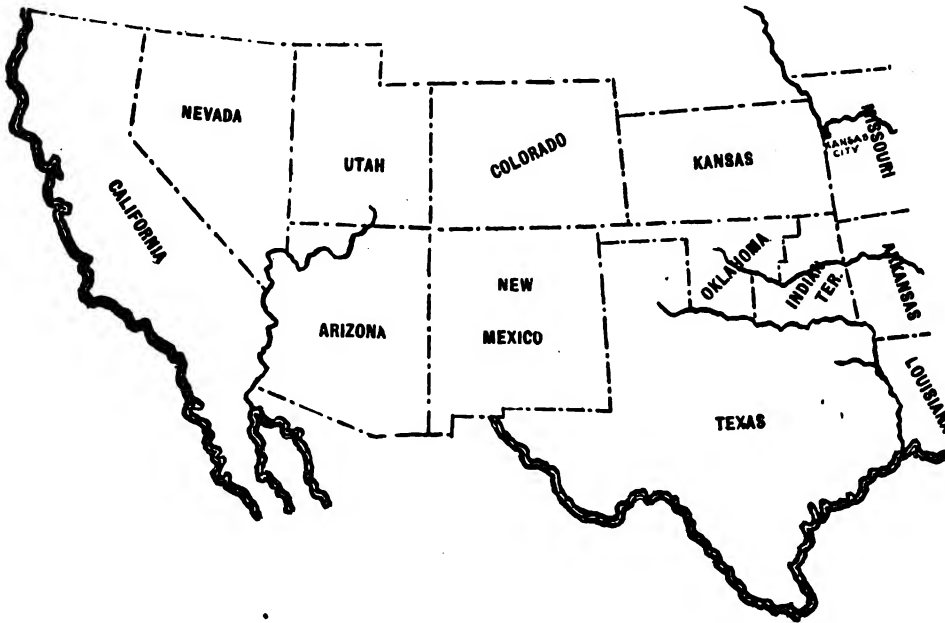
FOR THE USERS OF SMALL POWER, the Chapman gas and gasoline engine offers many advantages. They are guaranteed to give full

power without expert attention and are designed with a special effort to build an engine having all the good features of the best high class engines and with fewest and simplest parts that could be made to do the work in a successful manner. The advantages of this engine are enumerated in an interesting booklet issued by M. L. Chapman, Marcellus, Mich. A copy will be sent to any reader upon request.

THE JOHN LAUSON MFG. CO., of New Holstein, Wis., sent us a very interesting catalogue fully illustrating their fine line of stationary and portable gasoline engine. The engine manufactured by this company is known among the trade as the "Easy Starting Lauson." This firm guarantees to make good by repairing or replacement any part of their engines found to be defective within one year from date of shipment. The Lauson engine is carefully constructed, equipped with the latest and best improvements and is said to be one of the best reliable and economical machines on the market today.

SCHMIDT'S SIMPLEX FILING CHART is the name of a device intended for the convenient filing of correspondence, accounts, invoices, etc., without the aid of card indexes. It may be described as a square sheet with the entire alphabet on each of its four sides. The square thus described is divided by rulings into 6 or 7 small squares each numbered consecutively. The use of this chart eliminates the possibility of wrong filing and also does away with the index cards and the expense of their maintenance. It is unnecessary to refer to the chart when a paper is withdrawn from the files and its use will not interfere with any system now in use in any office. This chart has been used by leading firms in New York City for years and governing from 10,000 to 20,000 accounts. Copies of this chart, which is copyrighted, may be obtained from the compiler Mr. C. Schmidt, 46-48 Ridge street, New York City. Directions accompany each chart and copies are sold for \$1.00 each





Any established Horse Shoer, Blacksmith or Wagon Maker located in our trade territory, as shown on this map, who will send us his name and address will receive our Mail Order Way free of charge.

# THE FAETH IRON COMPANY

KANSAS CITY, MO.

EXCLUSIVELY WHOLESALE

## Blacksmith Supplies and Tools

We sell at wholesale to only those who are established and entitled to wholesale prices and our Mail Order Way contains much confidential information of great value to those who buy intelligently. Our store, containing 84,000 square feet of floor space is filled from basement to roof with everything a blacksmith buys or uses and our Mail Order Way tells the story. We open accounts on our regular terms of 60 days on receipt of satisfactory references.

**SEND US YOUR NAME AND ADDRESS**



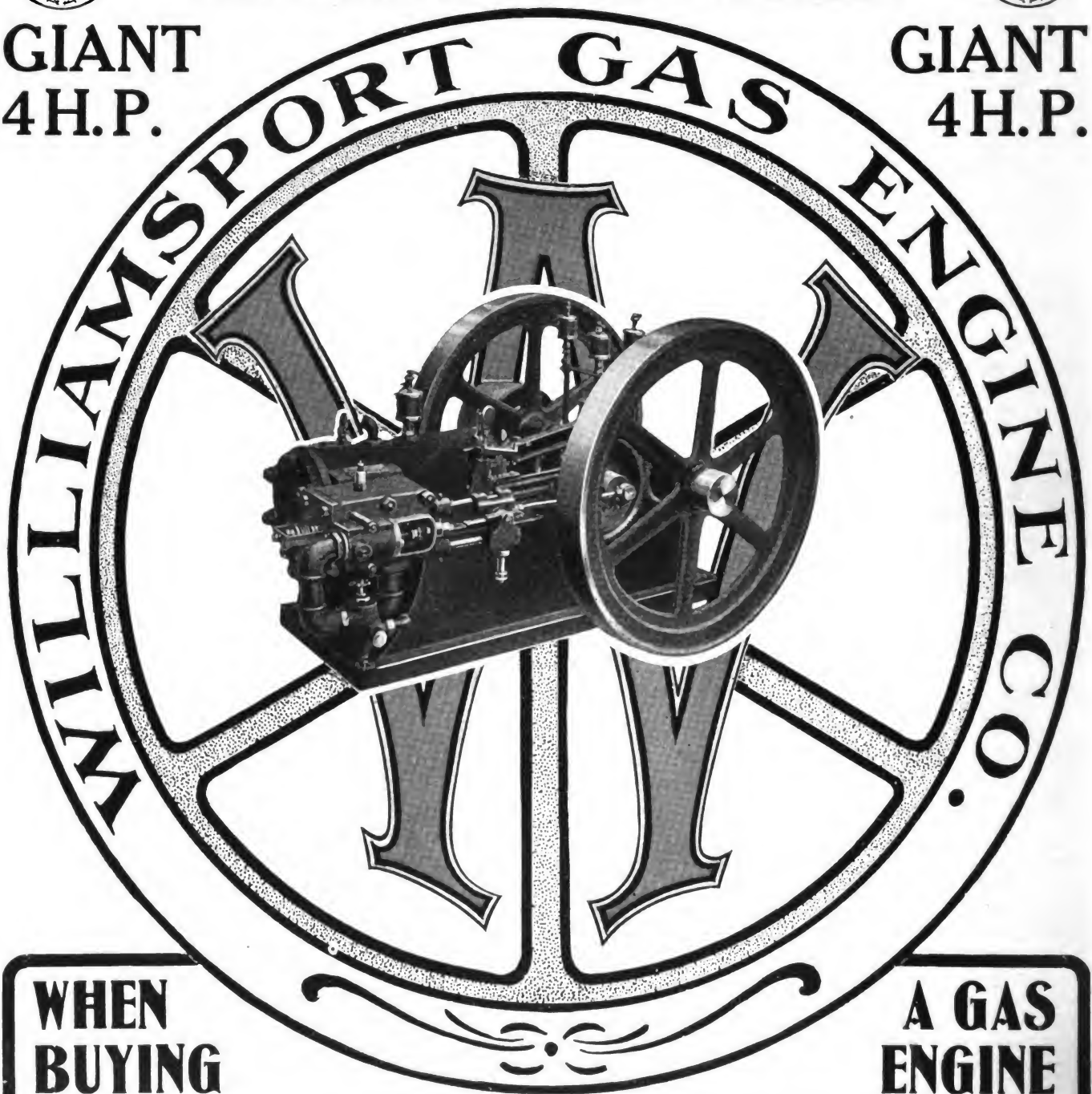


# THE SIMPLEST<sup>AND</sup> MOST ECONOMICAL GAS ENGINE ON THE MARKET



**GIANT  
4H.P.**

**GIANT  
4H.P.**



## WHEN BUYING

there are several points to take into consideration, foremost among them being **simplicity in design and economy in operation**. In these two requirements, as well as in every other feature **The Williamsport Engine** excels all others on the market. On the Williamsport type of gas engine you see a single or double eccentric in connection with our patented valve connecting rod which accomplishes all that the cams, rocker arms, latches and springs do on other engines. The Williamsport Engine is built by practical mechanics who have had over ten years' experience in everyday gas engine construction. Every engine is thoroughly tested before leaving our factory and is sold under a gilt-edge guarantee. We will replace any part found defective in workmanship or material free of charge within one year from date of purchase. Our engines are sold strictly upon their merits, and meet every shop requirement.

READY FOR MAILING

Our new illustrated catalogue containing a full description of all working parts of Williamsport Engines will be sent free of charge upon request. Drop us a postal and get this interesting booklet. You could not invest a penny to better advantage. Write today.

## WILLIAMSPORT GAS ENGINE COMPANY

WILLIAMSPORT, PA.

## ENOUGH SAID THE WONDER DISC SHARPENERS

Are being used in 24 States, in Canada and Mexico. Have you a Wonder Disc Sharpener in your shop? Do you want to make money easy? From \$20 to \$25 per day earned with the Wonder Disc Sharpeners.

FOR SALE BY  
LEADING JOBBERS.

MANUFACTURED BY

**A. E. DURNER,**  
EVANSVILLE, WIS., U. S. A.

Write for descriptive circular and price list.



For  
Gas or Gasoline  
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Sizes  
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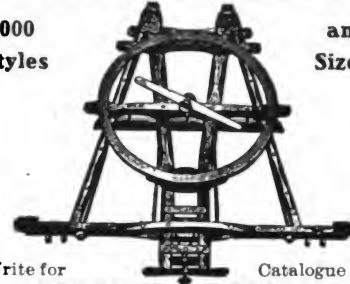
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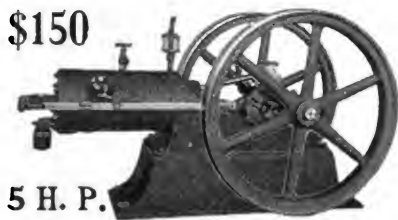
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**STANDARD**  
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## The Bruce Malleable Wagon Standard

This Malleable Iron Bolster Standard has been tested thoroughly, and we guarantee it strictly as represented.

Anyone familiar with the farm wagon will readily see the great advantages of the Malleable Iron Bolster Standard over the old style.

1. Made of the best grade malleable iron. It has been thoroughly tested by factories and wagon makers and pronounced a great success.

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3. The Malleable Iron Standard has a 3 x 9 in. face at base, which prevents wear on wagon box, while the old style has only a 7-8 inch face.

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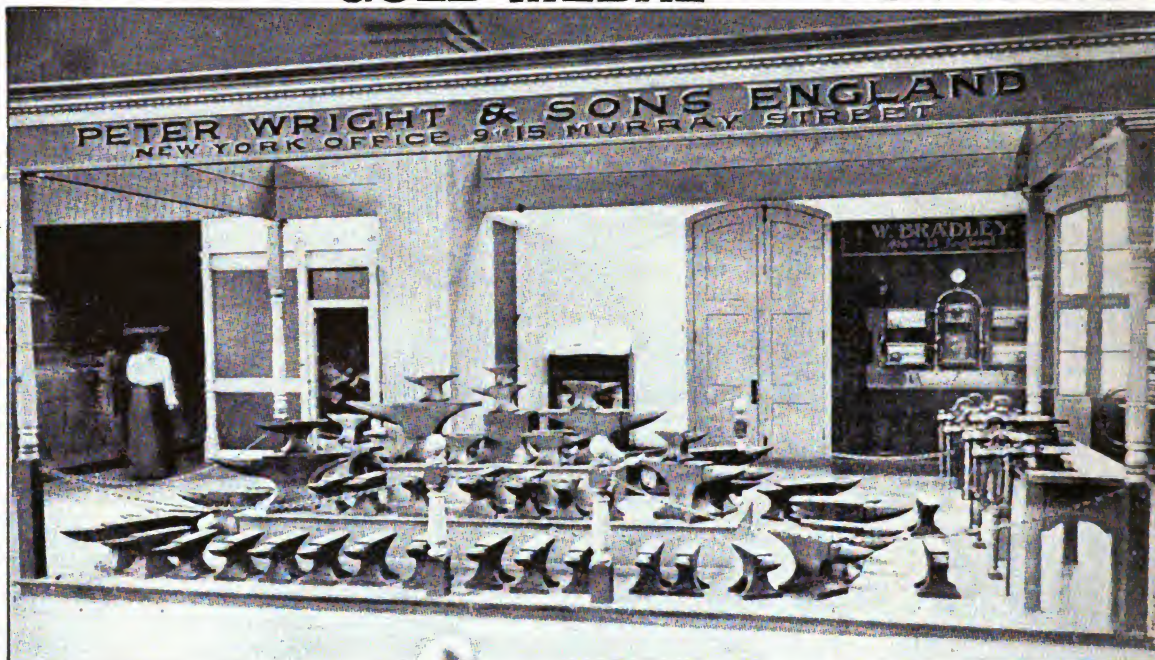
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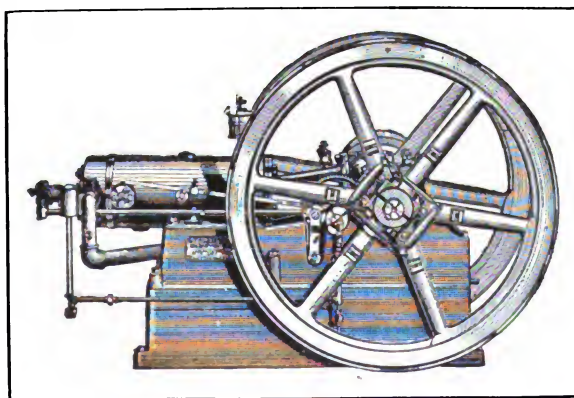
*Above everything else the shopman must have RELIABILITY.*

At his touch the power must be in motion.

It must not have the habit of getting out of order.

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Is just one of the distinguishing marks of I. H. C. Gasoline Engines. There's the unfailing response to every call, but there's also



*The Simple Machine,  
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These are features that will appeal to you if you need a power for any purpose. It will pay any power user to know all about the I. H. C. Gas and Gasoline Engines before he buys.

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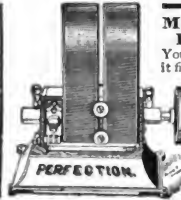
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Blacksmiths, wagon and buggy repairers especially, will see at a glance the merits of this axle cutter and appreciate its usefulness.

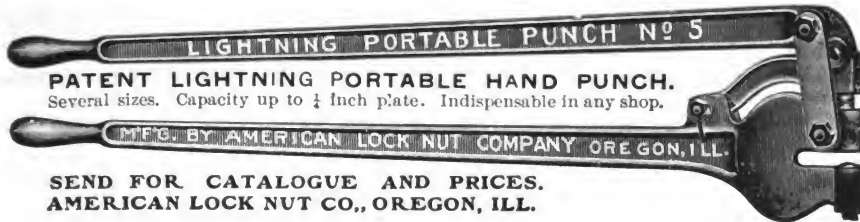
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**PATENT LIGHTNING PORTABLE HAND PUNCH.**  
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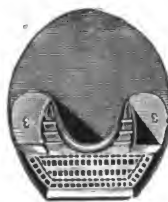
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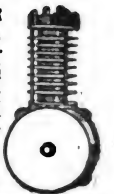
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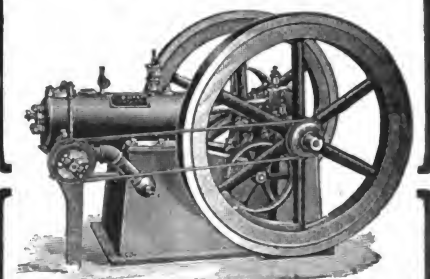
For Plow Work, Wagon Work, Heavy Work, Any Work.

"We have been using your Boss trip hammer for over a year and will say that to do without it would end the business for us as we have a great deal of plow work and to go back to the old method of drawing out a share would discourage me so much that I would quit the business. Any man having power should by all means have a Boss hammer." H. J. DUBBS & SON, Ransom, Kas.

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**GAS AND GASOLINE ENGINES**



(2-28 H. P.)

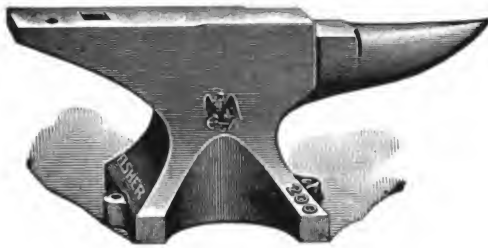
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The Face Consists of a Single Piece of the Very Best Cast Steel Perfectly Welded and of the Hardest Temper. The Horn is made of Tough Untempered Steel and will neither Break nor Bend. All "Eagle" Anvils made with the Latest Fisher Patent Double Thick Steel on Both Edges of the Face. Made in all Shapes and Sizes up to 1300 lbs. Weight.

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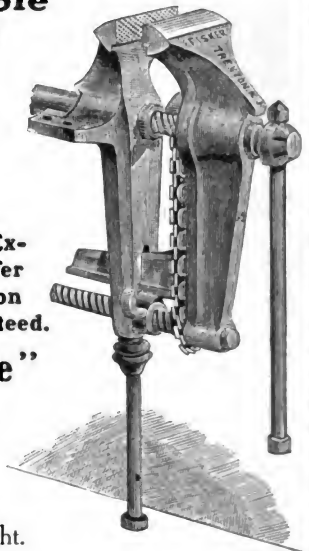
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IN THE MANUFACTURE OF  
**ANVILS AND VISES  
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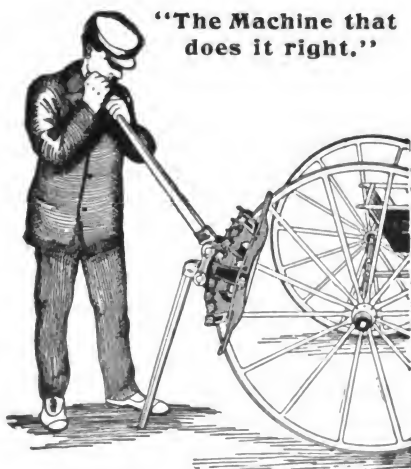
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Is sold by Reliable Dealers Everywhere. For Strength and Durability there are none better made. The "FISHER" is acknowledged the Best for Blacksmiths.

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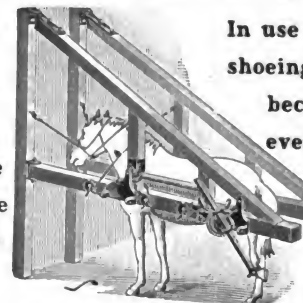
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Every one  
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guaranteed.  
All of the  
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cheap stocks  
eliminated.



In use in all modern  
shoeing establishments  
because they fill  
every shop require-  
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satisfaction  
everywhere.

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are simple, strong, solid, safe and sure to hold. No ropes or pulleys to tangle or break, no bracing to roof or floor, but furnished complete ready to bolt to the stationary posts in your shop. You can rely on the **BARCUS STOCKS every time.**

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Yours respt.,  
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Has a record of five toes per minute, and this machine in your shop will save you in cash at the rate of \$6,00 per day when in use.

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GEO. BARCUS & Co., Wabash, Ind.,  
SIR:—I am well pleased with the Barcus Improved Toe Calk Machine.

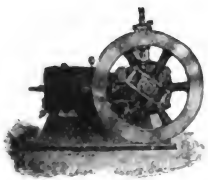
Yours very truly, FRANK NYE.  
Write for particulars.

**Geo. Barcus & Co.,  
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The 1906  
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3 H. P. 150 lbs.  
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**INDIANA TOP & VEHICLE CO.**

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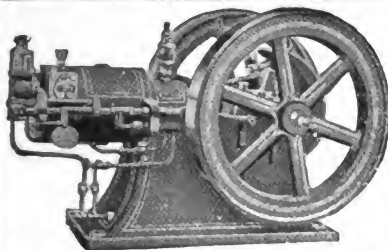
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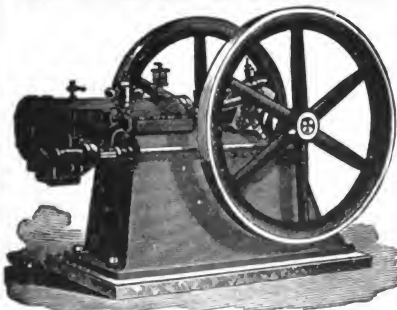
A gasoline engine of full  $3\frac{1}{2}$  guaranteed horse power. In every way suited to general blacksmith and machine shop work. Reliable in construction and reasonable in price. Special price on first engine in any locality, and good terms for agents. Other sizes 2 to 6 horse power for light power uses. Send for free book "Proof Positive;" shows how the engines are used and letters from the users.

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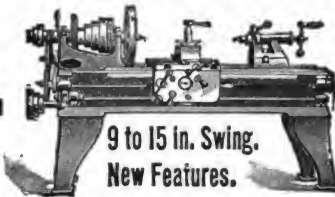
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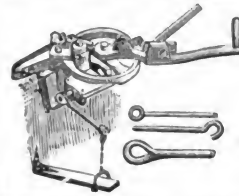
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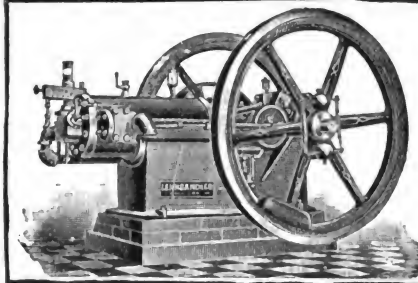
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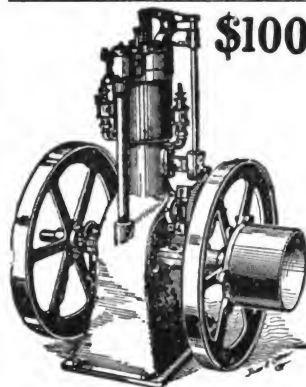
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MADE IN ALL SIZES.

Built especially for Blacksmith shop power. It means money in your pocket to find out about our engines before placing your order.

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IS A WONDER.

It will develop more power on less fuel than any other make in the world ....

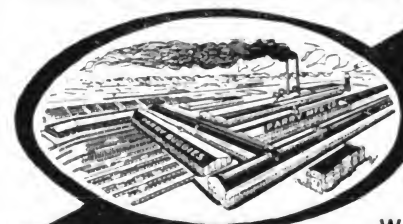
Built on modern lines and up to the very latest practice; made from the best material, and with ordinary care will last a life time.

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EVERY VEHICLE ABSOLUTELY GUARANTEED.



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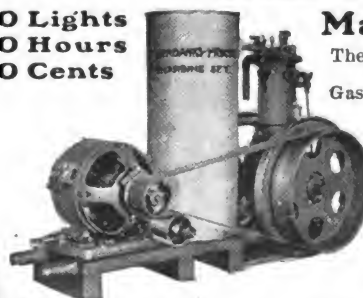
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10 Cents



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I may want ..... h. p. to run

Name ..... Street No. .... State .....





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Catalog Free.



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for all time is the....

**Metal Wheel**

We make them in all sizes and varieties, **TO FIT ANY AXLE.** Any height, any width of tire you may want. Our wheels are either direct or stagger spokes. Can **FIT YOUR WAGON,** Perfectly without change....

**NO BREAKING DOWN**

no drying out, no resetting tires **CHEAP** because they endure. Send for catalogue and prices. **Electric Wheel Co.,** P. O. Box A, Quincy, Ills.

## We Write Letters BY THE THOUSAND.

We have a process by means of which we can make circulars which look like personal type-written letters.

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Ignite your engine with our  
**IMPROVED I. C. C.**  
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We guarantee them against all imperfections in workmanship and material. Write us if your engine doesn't work properly.  
**INDUCTION COIL CO.,**  
COILS FOR BLACKSMITHS. MILWAUKEE, WIS.

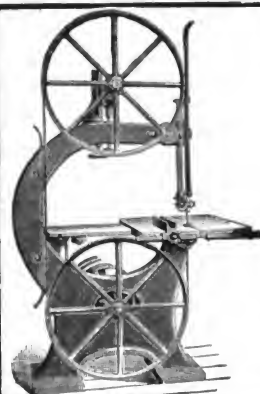
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We also make Cold Punched Nuts, Washers, Refined Bar Iron, etc.



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Wood Working Machines in your Shop will enable you to do better work and more of it than you can do with hand tools.

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Catalog describing a fine line of moderate priced **BAND SAWS, SAW TABLES** and **JOINTERS** mailed for the asking.

Send for it now.

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**BORAX-ETTE** makes steel weld easily. It does not have to be applied between the laps like other compounds, but is used the same as borax. It has no equal for all kinds of steel welding.

**SAMPLES FREE.**

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 GUARANTEED  
  
 Heave, Cough, Distemper and Indigestion Cure will effect a permanent cure for the ailments named. Recommended by veterinarians and owners. Every drug-gist in America has it or can get it.  
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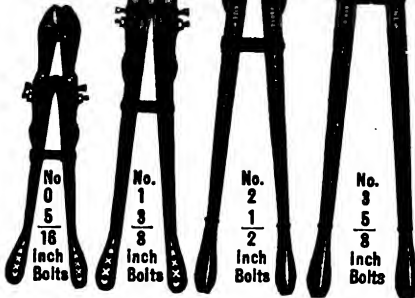
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 For Brazing Wires on Rubber Tires  
 GUARANTEED  
 Jobbers sell at Factory Prices, \$4.50 net  
**THE TURNER BRASS WORKS**  
 63 No. Franklin St. CHICAGO, ILL.

**"NEW EASY" BOLT CLIPPERS**

H. K. PORTER  
 SOLE M'F'R  
 EVERETT, MASS.

TRIED  
 AND  
 TRUE



REFUSE CHINESE IMITATIONS OF THESE TOOLS; THEY ARE INFERIOR.

**THE "BUSH" Low-down Handy Wagon**  
 WITH 4-IN. TIRE STEEL WHEELS  
 Our wagons are well ironed throughout—wheels made with round staggered spokes.



We make any size wheels to fit any skein.  
 We manufacture a complete line of metal wheels for corn planters, cultivators, plows, etc.  
 WRITE TO **C. BUSH, QUINCY, ILL.**  
 (MENTION THIS PAPER.)

**THE GENEVA**  
 Handy Farm Wagon  
 THE BEST METAL WHEEL WAGON MADE.

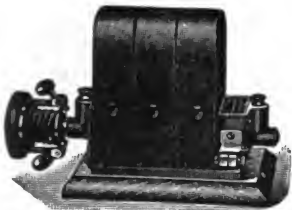


All Goods Guaranteed

Pressed steel wheels, any height and width tire, interchangeable hubs. Gears of selected stock, thoroughly ironed. Made in several styles.

WE ARE ESTABLISHING ONE AGENT IN EVERY TOWN.  
 Send for Descriptive Circulars to

**Geneva Metal Wheel Co.**  
 GENEVA, OHIO



**HENRICKS MAGNETO**

Fires your gas or gasoline engine without the aid of batteries.

It is better and more durable than any Dynamo. Its Governor regulates the speed regardless of speed of Fly Wheel. Its Governor adjusts to imperfect Fly Wheels. Its Governor insures a constant and uniform spark. The spark does not burn the contacts of the engine. All strains are removed from the bearings of Magneto. FULLY GUARANTEED. AGENTS WANTED.

**HENRICKS NOVELTY CO.**

135 S. Capital Avenue

INDIANAPOLIS, IND.



EACH ONE GUARANTEED

**BOLT CLIPPERS**

**CHAMBERS BROS. CO.,**

N. Fifty-Second Street,  
 Philadelphia, Pa.

**Solid Tire Applying Machines.**

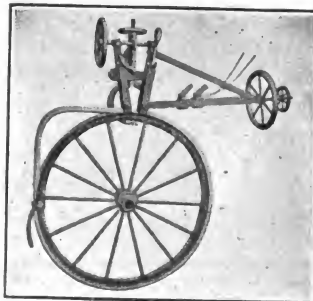
For applying internal and side  
 WIRE TIRES.

Special Machines built to order.

Write for new, illustrated Catalogue, just out, describing our complete line.

**NELSON AND LE MOON,**

105-107 SO. JEFFERSON ST.,  
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The Original Internal Wire Applying Machine.

**HAND FORGED**



**BUTCHER KNIVES**

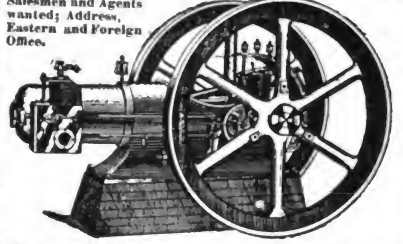
**A GOOD SIDE-LINE**

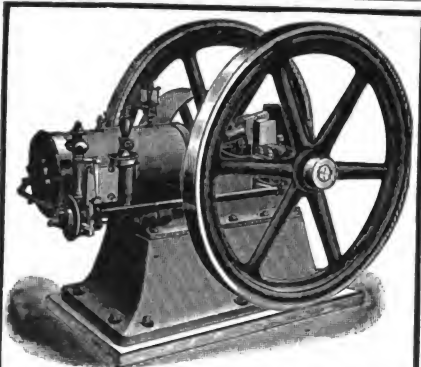
Hundreds of blacksmiths are making large profits by selling these blades. Each one is fully warranted. Made of Sanderson Steel.  
 Round or riveted. All sizes from 5 to 8 inch.  
 Handles ready to put on, 1c each.

**\$ .15 EACH**  
**\$ 1.50 DOZ.**

Hand Forged Razors, ready to use, 40 cents each.  
 Pocket Knife Handles in variety, 10 cents each. Send for sample.

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Salesmen and Agents wanted; Address, Eastern and Foreign Offices.  
  
 Why buy an experimental gas engine, when for the same money you can buy one that has stood the test for twelve years, and have the further advantage of being able to use it either with gasoline or kerosene. Built in sizes of from a 100 H.P. Write for our large catalogue and prices, if interested.  
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**ST. LOUIS EXPOSITION**

FOR

**Efficiency  
 Durability  
 Simplicity**


Write for Catalogue and Prices,  
**BAY STATE GAS ENGINE CO.,**  
 48 Washington St., North,  
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**Ball Bearing MACHINERY.**

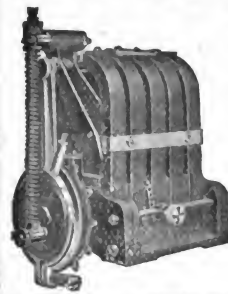
Rip Saw, Band Saw, Boring and Spoke Tenoning Machine all in one. Each attachment ready for instant use, either for foot, hand or belt power.

Write for circulars and price list.

**PARKS**  
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1501-07 Knowlton Ave.  
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The Goodson Igniter is guaranteed to produce a sufficient spark to start a gas or gasoline engine without batteries or spark coil.

Send for Catalog.

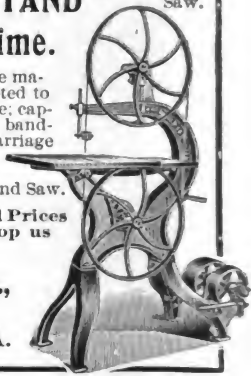
**Goodson Electric Ignition Co.**  
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## BUILT TO STAND 24-inch Band Saw. the Test of Time.

A well-made, accurate machine; especially adapted to run by gasoline engine; capable of all kinds of band-sawing, particularly carriage repair work. These are a few of the fine points of Marston's Band Saw.

We will gladly send Prices and Circulars. Drop us a Card today.

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—BETWEEN—  
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The D. & B. Line Steamers leave Detroit weekdays at 5:00 p. m., Sundays at 4:00 p. m. (central time) and from Buffalo daily at 5:30 p. m. (eastern time) reaching their destination the next morning. Direct connections with early morning trains. Superior service and lowest rates between eastern and western states.

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**BADGER GASOLINE ENGINES**  
**Turn Time Into Money**

Badger Engines enable the blacksmith to make the most money out of his time by enabling him to do more, better and a greater variety of work, and at the same time employ less help—saving cost of helpers.

The "Badger" stands for superior excellence and efficiency the world over.

Badger Engines are easy to start and to keep going; cost almost nothing for repairs and last a life-time. They are as cheap as is consistent with best skilled workmanship.

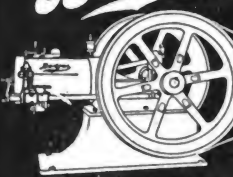
Send at once for our Fine Book, illustrated in colors—It's FREE. It tells all about Badger Gasoline Engines, and why they are the best on earth for the Blacksmith. Write today, before the books are gone.

Special discount to Blacksmiths who take an agency.

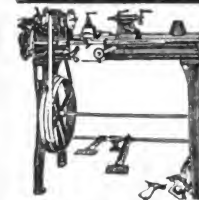
Write for attractive terms.

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"The world's standard for efficiency"



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We also make Wood Lathes from 6 in. to 14 in. swing. If you are in the market for any tools, our catalog will be mailed free to any address. Shall we mail you one?

**Carroll-Jamelson Machine Tool Co.**  
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**"QUICK ACTION"**  
**IGNITING DYNAMOS**  
Excel All Others!

The only generator that cannot lose its magnetism. For either make and break, or jump spark coils. Also spark coils. Send for Catalogue B.

**The Knoblock-Heideman Mfg. Co.,**  
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**BADGER**  
N° 15

Weight 800 lbs.

**Mr. Blacksmith:**

Here is a Punch and Shear that will punch and shear just as we say with

**ONE MAN ON LEVER.**

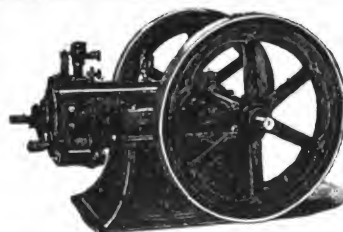
Punch  $\frac{5}{8}$  in. hole in  $\frac{1}{2}$  in. Iron  
Shear 4 x  $\frac{1}{2}$  in. Flat Iron  
" 7 x  $\frac{1}{4}$  in. Band Iron  
" 1 in. Round Iron.

Write for Prices, Etc.

**Rock River Machine Co.,**  
JANESVILLE, WIS. U. S. A.



**"THE RELIABLE" Gas Engine.**  
Just what the Blacksmith wants. You will not be without one after getting our prices and circulars. Write today.



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Printers of THE AMERICAN BLACKSMITH, also Complete Equipment for the production of Machinery Catalogues, Stock Farm Catalogues, College Annuals, and Catalogues in Foreign Languages, promptly, accurately and tastefully : : : : :

## THE WATERLOO BOY

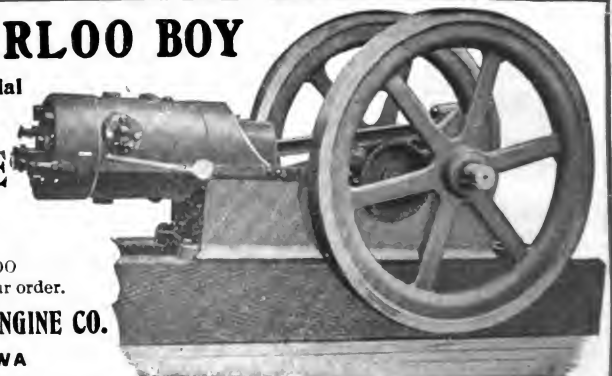
Our Blacksmith's Special  
3  $\frac{1}{2}$  to 4 H. P.

## GASOLINE ENGINE

The Engine Is Right!  
The Price Is Right!

Investigate the WATERLOO before placing your order.

**WATERLOO GASOLINE ENGINE CO.**  
WATERLOO, IOWA





## Potters Spring Brake Blocks

For Vehicles of all kinds with STEEL OR RUBBER TIRE.  
Have a record of excellency for seventeen years. **• • •**

**The MORGAN POTTER CO.**

SOLE MANUFACTURERS.

CATALOGUES.

FISKHILL ON HUDSON, N. Y.

**ONLY 60 CENTS**

Did you ever try to shoe a horse that would not stand still? By the use of my great



**Pulley Breaking**  
Bridle you can make the most restless horse stand as quiet as a lamb—even ugly horses, stallions, etc., completely subdued while being shod. Price, **Only 60c postpaid.** You should own one. Will bring business to you. Send for circular telling all about it.

PROF. J. W. BEERY, PLEASANT HILL, OHIO.

## "CHICAGO" EMERY WHEELS CUT QUICK

A wheel that will do the work in one-fourth to one-half less time is by far the cheapest in the long run. A wheel that will save only one hour per day during your busy season would pay for itself in full.



## "CHICAGO" WHEELS SAVE TIME

They're made  
of stuff that cuts

Emery Wheels, Glee, Emery, Polishing Wheels, Grinding Machinery

136 Page Catalogue for the Asking

*Chicago Wheel & Mfg. Co.*  
42 W. RANDOLPH ST.  
CHICAGO, U. S. A.



## HIGHEST GRADE

Ignition Generators do away with EXPENSE and TROUBLE of batteries. Can be easily installed with any engine and is very simple. This Magneto regulates its own speed and furnishes constant spark at all times. **INFORMATION ON REQUEST.**

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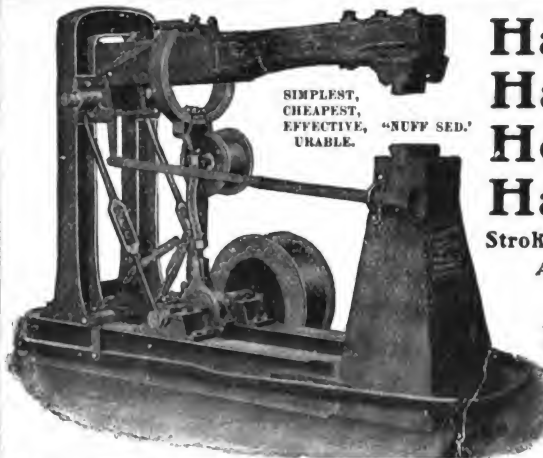


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Cools tires quickly. No burnt rims. No smoke. Can be raised and lowered in an instant.

Many satisfied customers. Write for circulars and prices.

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Miamisburg, Ohio.



SIMPLEST,  
CHEAPEST,  
EFFECTIVE, "NUFF SED."  
URABLE.

## Hathorn's Hard-hitting Helve Hammer.

Stroke adjustable while running.

Ask your dealer or write to

**HATHORN  
FOUNDRY &  
MACHINE CO.**  
GRINNELL,  
IOWA.

## THE SINNING GAS ENGINE

Is the simplest, most durable, and most reliable on the market.

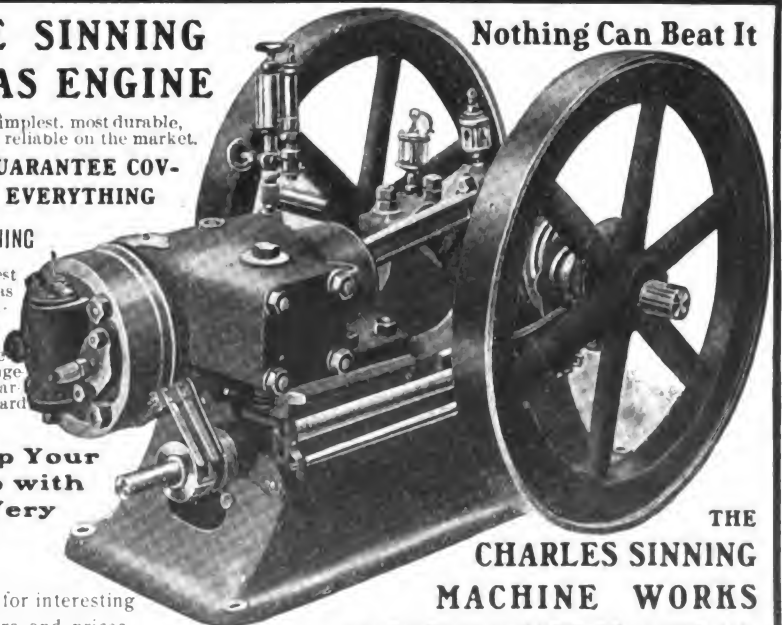
**OUR GUARANTEE COVERS EVERYTHING**

### THE SINNING

is cheapest to run, has few working parts, all of which are interchangeable. Bearings all hard bronze.

**Equip Your Shop with the Very Best**

Write for interesting circulars and prices.

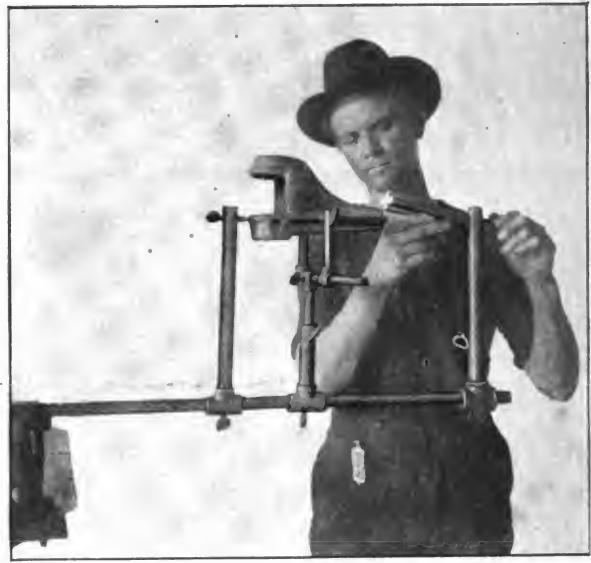
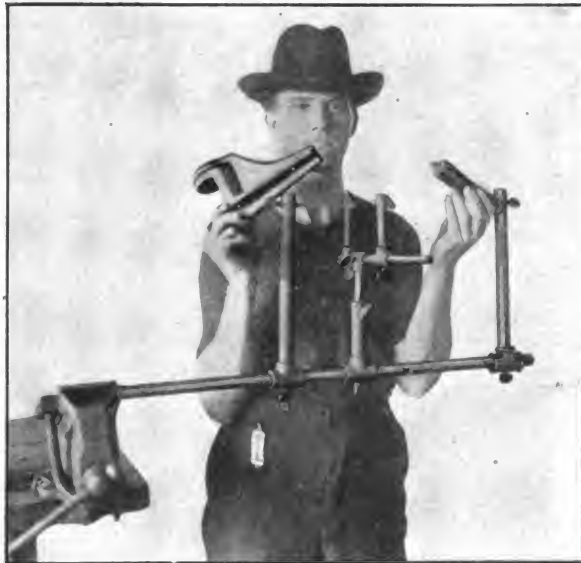


Nothing Can Beat It

THE  
**CHARLES SINNING  
MACHINE WORKS**

242 DICKSON STREET, ST. LOUIS, MO.





## WHAT IS A BRAZING COMPOUND WITHOUT SOMETHING WITH WHICH TO HOLD YOUR WORK

Nearly as bad as a wagon without a tongue. You have had experience and know. It's hardly necessary to tell you again but it's so true that you cannot braze one-third the castings that you would like to braze, that we cannot help saying so for fear that you may have never bought any Brazing Compound and think when you get the compound you have the brazing problem solved. It is not so, your troubles have just begun. No compound will hold the work and it has to be held. The photographs here show a casting that weighed 10 lbs. that was brazed in ten minutes. He got one dollar for that piece of work. The customer saved two days time, twenty-five cents telephone, forty cents expressage. The casting would have cost two dollars. The Blacksmith made a Dollar and a friend too, all done by owning a "LONE STAR BRAZING HOLDER" about the simplest device imaginable but the most practical. It will hold most any odd shaped casting, circular, half-circle, zig zag, it's adjustable to any kind. This tool is so simple and does its work so well you will say when you have seen and tried one, "Now why didn't I think of this." We did though and patented it. We sell the Holder Complete with Compound for \$10.00, Holder only \$6.00. Compound only \$4.00, charges paid when the money is remitted with the order. We will send any reliable Smith a Holder and the Compound on trial on receipt of two dollars and if it will not do what we say it will you can express it back. We have experimented with the various compounds and know that the LONE STAR (which is patented), will do the work in a way which no other will.

One Blacksmith writes: "Your Brazing Holder and Compound is all you claim for it. All the work I have done with it is much better than it was before it was broken. Every Blacksmith should have one." Another one says, "The outfit is more than you claim for it. Enclosed find check for \$10.00." Still another comes back like this, "It's just the thing that every Smith needs and I heartily recommend both the Holder and Compound to my fellow craftsmen. I find the compound far excels anything of the kind I have ever used." We send everything prepaid on receipt of the price and you can express back to us C. O. D. if it is not just what we say.

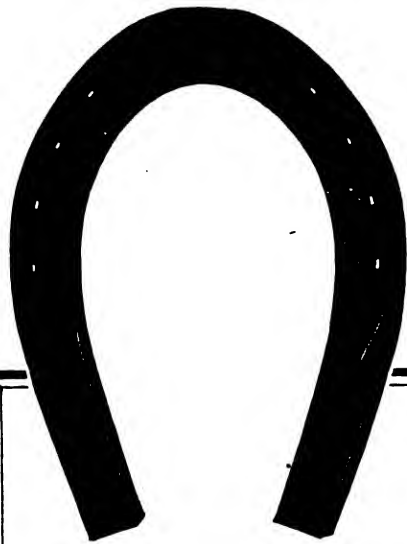
## THE LONE STAR BRAZING CO.,

MANUFACTURERS LONE STAR BRAZING HOLDER AND COMPOUND,

FORT WORTH, TEX.







## WHEN YOU BUY HORSE SHOES

Is it not preferable to make your selection from the most complete line and the best shoes on the market?

## UNITED STATES HORSE SHOES

"In a Class by Themselves"

OUR Illustrated Catalogue shows all sizes and patterns. The book is free. We will gladly send a copy to your address. Write today



We are giving away a handsome souvenir stick pin to every smith who sends his name and address. Did you get one? Don't wait until they are gone. Write today.



UNITED STATES HORSE SHOES

— ARE SOLD BY —

LEADING JOBBERS  
EVERYWHERE



## United States Horse Shoe Co.

ROLLING MILLS  
and FACTORY

Erie, Pa.

## AS TO GAS ENGINE BATTERIES

There may be better batteries made in years to come—no doubt there will be—we are improving every year—but there is no battery more favorably known to gas engine men today than the Acme dry batteries they are now using.

It is called the Acme because it is the culmination of a devoted effort by experiment and skill to produce perfect ignition.

None so strong, none so enduring, and none that has stood so well the tests of experience.

Other batteries for other uses. Catalogue on request.



The NUNGESSER  
ELECTRIC  
BATTERY CO.,  
27 King St.,  
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## This Disc Grinder is a Winner

Every blacksmith with power should have one. It is designed to sharpen all sizes and styles of discs. By removing roller clamp you can sharpen axes, hoes, shovels, plow points, plow sweeps, cold chisels, lathe tools, etc. Especially advantageous for sharpening or grinding the edges of concavo-convex discs and it is so constructed that the disc can be securely held at any desired angle and fed to a grinding wheel. The disc holder rotates during the grinding operation and by the use of a novel arrangement of gears both the disc holder and the grinding wheel can be operated from one shaft. A roller clamp is used for holding the edge of the disc upon the grinding wheel and a smooth and uniform edge is thus produced upon the disc.

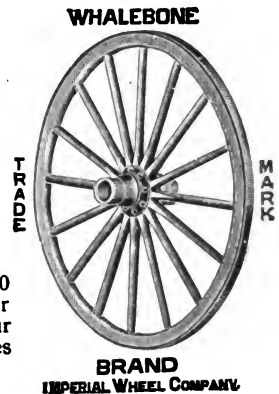
Write for Particulars  
SHIPP & DICKERSON,  
Renner, Texas.

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You'll find in our NEW 288-PAGE 1906 CATALOG; THE GREAT PRICE-MAKER FOR THE TRADE. Every man in the TRADE should have one—valuable for reference; still more valuable as a MONEY-SAVER.

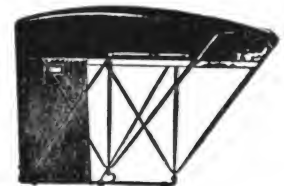
### WHALE-BONE BRAND WHEELS

Unequalled in quality and price. Every wheel perfect and fully guaranteed for one year. 2000 sets in stock. For prices, consult our catalog, pages 218, 219.



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made in our own shop. On pages 201-209 in our catalog, you will find unquestionably the finest assortment of tops and seat trimmings ever presented to the trade. Prices right. Send for free samples.



## TIRE BOLTS

1 3/4 x 3-16

**\$1.10**

PER BOX OF

**1000**



Better stock up now; our prices are beyond competition. Sample tire bolt on application.

Remember, our catalogue is free to the trade and a card will bring it. You cannot invest a penny to better advantage.

WRITE TODAY.

**CRAY BROTHERS,**

1244 West 9th St., N. W.

**CLEVELAND, OHIO**

## S. N. BROWN & CO.

DAYTON, O.  
—MANUFACTURERS OF—  
Vehicle and Automobile Bows

### New Era Electric BLOWER

Direct connected, has been designed especially for the blacksmith and it is his ever ready helper that works for less than five cents a day. It never tires. It places him on equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.



Write for circular and particulars.

942 W. Lake St. CHICAGO.

NEW ERA ELECTRIC CO.,

## FOR HORSESHOERS VETERINARIANS

A TEXT BOOK OF  
**HORSESHOEING**

BY A. LUNGWITZ.

Translated from the 10th German Edition  
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178 Pages-160 Illustrations

CLOTH, \$2.00 NET

THE BEST BOOK PUBLISHED  
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Chicago, Milwaukee & St. Paul Railway

In going to St. Paul, Minneapolis or the Northwest see that your ticket west of Chicago reads via The Pioneer Limited on the Chicago, Milwaukee & St. Paul Railway—the route over which your letters go. Standard and compartment sleepers with longer, higher and wider berths. Leaves Union Station, Chicago, 6.30 p. m. daily; arrives St. Paul next morning at 7.25 and Minneapolis at 8.00 o'clock.

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FLOW SHADE AND OTHER STEEL SHAPES

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**VICES**

FOR THE IRON AND WOOD WORKER

STRENGTH AND DURABILITY GUARANTEED

Our patent Universal Vises are used in the best shops in the country. Made in all sizes, all styles for all purposes. Swivel or stationary bottom. Can be quickly changed to hold work in any convenient position.

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Every Craftsman  
will be interested  
in this.

**T**HE next volume of The American Blacksmith will be bigger and better than ever before, and to secure good practical reading matter for this larger paper, we offer a prize of \$5.00 each for the five best articles of any length on any subject connected with the smithing craft. To all other contestants whose articles are accepted and published, a year's subscription to The American Blacksmith will be given.

The articles may be on any practical shop topic. Your manuscript can be submitted at any time between now and December 10th.

### It's the Man in Every-day Harness

who is learning new kinks, and we want to tell our readers about them.

**OPEN TO ALL:**—Any person can submit as many articles as desired, thus increasing his chances of a prize or prizes. Each manuscript should be plainly written and on one side of the paper only. All articles must be headed "Prize Contest." If you desire to submit more than one article, all need not be sent at the same time. A good suggestion is to write your articles as you come across the new devices or think of ideas of value to the craft. Remember that each published article wins a prize. Send in as many articles as possible and increase your chances for one of the big prizes.

**The American Blacksmith Co.,** BUFFALO, N. Y.  
Box 974.

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TRADE **WELDARINE** MARK.  
REGISTERED

To BLACKSMITHS, MACHINISTS and Repairers of Machinery.

WITH

# WELDARINE

You can braze any casting that you can get hot and make it as good as ever without patches of any kind.

You can braze cast-iron or any form of iron or steel, cast-iron to steel or cast iron to copper.

**WELDARINE** can be used successfully in an ordinary forge or with a brazing torch.

There is not a shop, manufacturing plant, and scarcely a household in which there is not some broken cast-iron article which the owner would have repaired if it could be done neatly and at a moderate price.

**WELDARINE** at once opens up a new and PROFITABLE field for anyone who will cultivate it. Let it be known that you can braze cast iron; braze a few pieces and the knowledge of it will soon get around and bring you a continually increasing amount of work.

**WELDARINE** is one of the most practical of recent discoveries and will become as staple in the blacksmith shop as sugar in the household. Sold under a positive guarantee to give perfect satisfaction by leading jobbers everywhere.

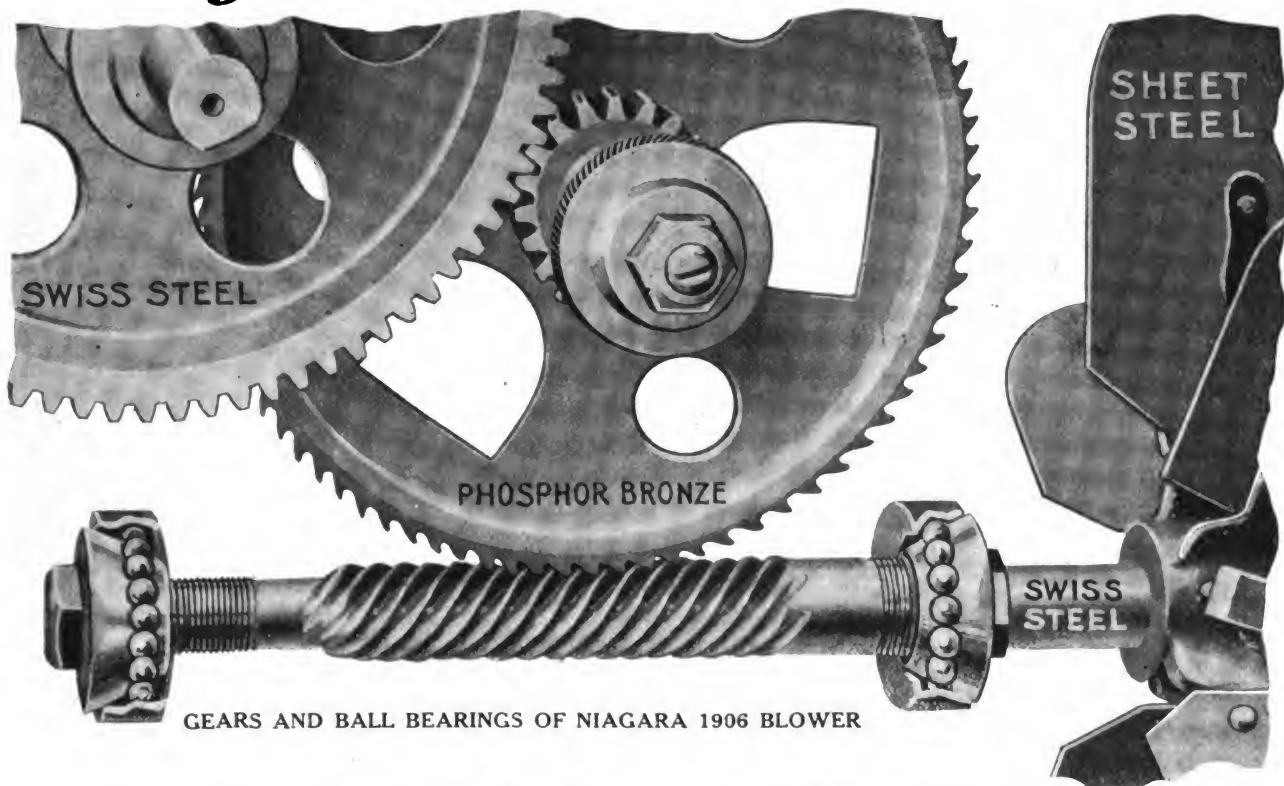
One set of **WELDARINE** will do from \$50 to \$75 worth of work. Costs you \$4 per set. Put up in four packages and quick cleaner in a neat wooden box.

**SAMPLE SET, ONE DOLLAR.**

If your Jobber is not at this time handling **WELDARINE**, send us \$1.00 for a sample set of **WELDARINE** that will do from \$10 to \$15 worth of work, or \$4.00 for full working set. Sent charges prepaid to any address. Satisfaction guaranteed or money refunded. Kindly give us the name of your Jobber, and we will arrange for him to supply your future needs.

**THE WELDARINE MANUFACT'G CO., (Inc.)**  
111 E. Seventh St., TOPEKA, KANSAS, U. S. A.  
Cable Address, "WELDARINE," Western Union Code.

# Niagara 1906 Blower



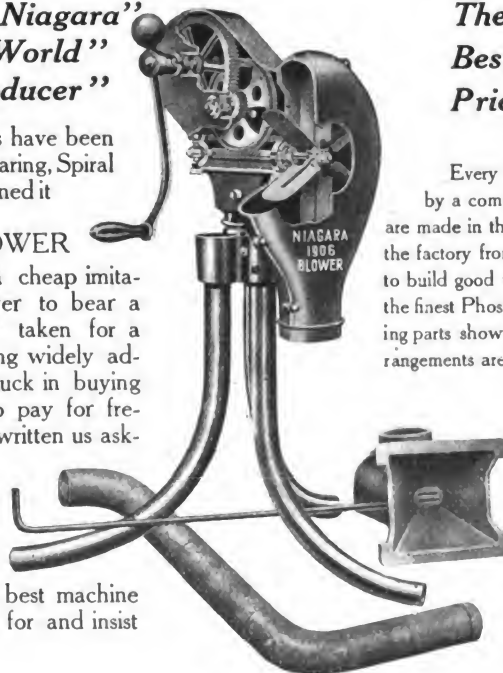
GEARS AND BALL BEARINGS OF NIAGARA 1906 BLOWER

***"Like The Noble Grand Niagara"***  
***"The Wonder Of The World"***  
***"The Great Power Producer"***

So many similar commendations have been received from users of our Ball Bearing, Spiral Shaft Blower that we have christened it anew

## NIAGARA 1906 BLOWER

so as not to confuse buyers with cheap imitations. This is too good a blower to bear a name or number that might be taken for a cheap, inferior machine now being widely advertised. Those who have got stuck in buying the wrong Blower have had to pay for frequent repairs. Many such have written us asking if we will build them a set of gears that will not cause such trouble. Therefore we have renamed our wonderful Ball Bearing Blower so as to insure and protect all buyers getting the best machine on the market, in the future. Ask for and insist on having Niagara 1906.



***The New Niagara 1906 Blower***  
***Best In The World***  
***Price Lowest Of Any***

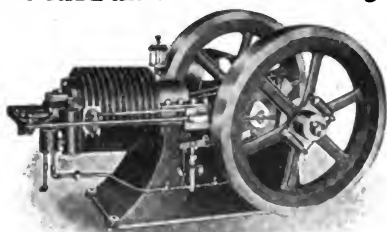
Every user of a Niagara 1906 Blower is protected fully by a company financially responsible. The Niagara gears are made in the largest and best equipped factory in the world—the factory from which all others have endeavored to learn how to build good work. In the Niagara Gears and Bearings, only the finest Phosphor Bronze and Swiss Steel are used. The working parts show as fine workmanship as a watch. The oiling arrangements are perfect and absolutely eliminate friction and wear.

The blast is equally strong when handle is turned in either direction. Each and every

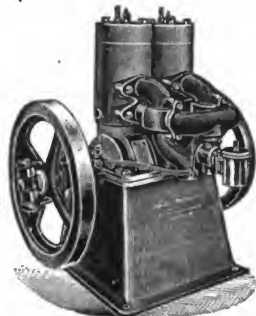
Niagara 1906 Blower is furnished with our new center and side blast tuyere which is positively the best of its kind on the market.

Your dealer will quote you a lower price on Niagara 1906 Blower than he can quote you on any other geared hand blower on the market. Notify us of any similar Blower selling at lower price. Send for new illustrated Catalog of Blacksmith Tools. Just out.

## Lancaster Forge & Blower Co. Buffalo, N.Y.

**The GADE Air Cooled Gasoline Engines**

Made in 2, 3 and 6 horse power sizes. What's the use of paying good money for an old style engine, when you can get something better in the "Gade Air Cooled" at the same cost. Buy one. It will not freeze up or go back on you in cold weather. It's ready for business all the time. We know it will please. By all means write for descriptive circulars and price list of the "Gade." Address. **GADE MFG. CO., Iowa Falls, Iowa.**

**The Maxwell & Fitch Gasoline Engine**

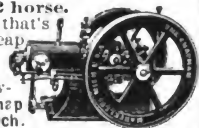
Two cycle, a power impulse every revolution, we use no gears, cams, cam shafts, valves or valve springs, no engine can be simpler or more durable. If you want a well built engine, one built of the best materials, then just send us a postal for our catalogue and price list.

**THE MAXWELL & FITCH CO.**  
ROME, N. Y.

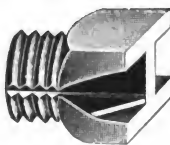
**PATENTS** Promptly Secured.  
Highest references from prominent Manufacturers  
Write for Inventors' Hand Book.  
**SHEPHERD & PARKER, 850 F St., Washington D. C.**

**CHAPMAN ECONOMIZER**

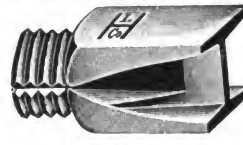
1 1-2 horse tested to 2 horse.  
He wanted a good one, that's why he didn't buy the cheap kind, but bought the simplest, strongest, and best designed, for the lowest possible price of H. L. Chapman Box A. B. Marcellus, Mich.



To satisfy your customer use the **H-CALKS**



Half worn, always sharp!



When New.

16 Beaver St.,

**H-CALK CO., INC.**  
New York City.

**Why Not  
Stop Your  
Troubles?**

"A Wizard  
Tubular"  
Does It.



Armature incased in WATER-PROOF non-corroding brass tube.  
All brass screws. Friction, Belt or Governor drive.  
Brush-holders removed without loosening screws.  
All parts polished brass. Contact and Jump Spark.  
A TRIAL WILL CONVINCE YOU.  
Most popular and satisfactory Magneto on the market.  
Price as popular as Machine.

GOVERNOR DOES AWAY WITH BATTERIES AND SWITCHES.  
**HERCULES ELECTRIC & MFG. CO.**  
701 Langdale Ave., INDIANAPOLIS, IND.  
Write for catalogue and SPECIAL OFFER.

**PATENTS that PROTECT**  
Our 3 books for Inventors mailed on receipt of 6 cts. stamps  
**R. S. & A. B. LACEY, Washington, D. C. Estab. 1889.**

**Rose Polytechnic Institute**

**TERRE HAUTE, IND.**

A College of Engineering. 24th year. Courses in Mechanical, Electrical and Civil Engineering, Chemistry and Architecture. Extensive shops. Modernly equipped laboratories in all departments. Expenses low. For catalogue containing full information and professional register of Alumni, address

**C. L. MEES, President.**

**ZIEGLER NECKYOKE CENTERS**

the only practical lock neckyoke on the market. None better for safety and durability. Very handy for repair work. Have you tried them?

Ask your jobber for them.

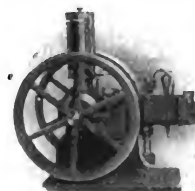
Descriptive circulars free.

**THE ZIEGLER NECKYOKE CO., Coffeyville, Kas.**

**ECLIPSE  
GAS AND GASOLINE ENGINES.**

Vertical 2, 3, 4, 5, H. P.  
Horizontal 5, 10, 12, 15, 20, 25, H. P.  
Designed and Built for BUSINESS.  
Catalogue on request.

**MYRICK MACHINE CO., Olean, N. Y.**

**MIETZ & WEISS  
KEROSENE ENGINES**

GAS AND OIL, 1 1/2 to 70 H. P.  
Safe, Reliable, Economical.  
Send for Catalogue.

**A. MIETZ.**  
128-138 Mott St., New York.

**THE ENGINE YOU WANT**

Forged Steel Crank Shafts,  
Steel Billet Connecting Rod,  
Heavy Fly Wheels,  
Heavy Piston,  
All Parts well  
Made by High  
Grade Me-  
chanics.  
All this means  
less cost to run  
than any other  
engine, for there  
will be less Fuel  
used.

Write us for  
Catalogue.

**WEBER GAS and  
GASOLENE ENGINE CO.**

P. O. Box 399,  
**KANSAS CITY, MO.**





# NO. 6 $\frac{1}{2}$

## CONCORD EXPRESS AXLE

Specified on 75 Wagons for St. Louis Transfer Company

This Letter will tell you why.

**Sold on  
Merit**

—and—

guaranteed to be stronger, run easier and outwear all other Concord Axles on the market. A trial order will convince you of their superiority.

ST. LOUIS TRANSFER COMPANY.  
GENERAL DEPOT.  
CITY BLOCK, BROADWAY, SPRUCE AND VALENTINE STREETS.  
Chicago & Alton R. R.      Chicago, Peoria & St. Louis R. R.      Mobile & Ohio R. R.  
C. C. C. & St. L. R'y Co.      Baltimore & Ohio Southwestern R'y.      St. Louis Southwestern R'y.  
Leavenworth & Nashville R. R.      Toledo St. Louis & Kansas City R. R.      Weibach R. R. Co.  
Illinois Central R. R. Co.      Louisville, Henderson & St. L. R'y.      Vandalia Line  
Chicago, Burlington & Quincy R. R. Co.      Louisville, Evansville & St. Louis R. R. Co.  
UNLIMITED STORAGE FACILITIES.      OFFICES, No. 400 SOUTH BROADWAY.  
W. F. TUFTS,      St. Louis, Mo.; March 26th, 1906.  
General Superintendent.

When replying please refer to No. \_\_\_\_\_

Sligo Iron Store Co.,  
945 North Second St.,  
St. Louis.

Gentlemen:—

This Company is about to increase its equipment and has made the contract for the building of some seventy-five wagons.

As for many years your Company has been furnishing this Company its regular material, and as during that time, this Company has made use of the No. 6  $\frac{1}{2}$  Cleveland Axle, I am pleased to say that in the order which was given for these wagons, that axle was specified, this Company being convinced that the best service can be obtained its use.

Yours truly,

*W. F. Tufts*  
General Superintendent.

**Sold on  
Merit**

—and—

guaranteed to be stronger, run easier and outwear all other Concord Axles on the market. A trial order will convince you of their superiority.

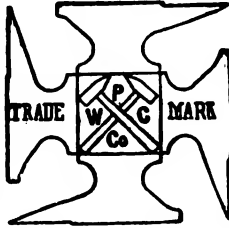
If you cannot get the No. 6  $\frac{1}{2}$  Concord Express Axle of your Jobber, write us.

**Cleveland Axle Manufacturing Co.**  
**CANTON, OHIO.**

**YOU WILL NEVER FAIL**

*To Make a Strong, Clean Weld If You  
Use Perfection Welding Compound.*

We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



Perfection Welding Compound will do the trick quickly and neatly. It makes a stronger weld than any other compound manufactured, as proven by the tests it has undergone. Send for free sample.

PRICE CONSISTENT WITH QUALITY.

**PERFECTION WELDING COMPOUND CO., SCRANTON, PA.**

**THE STERLING POWER HACK SAW**

COMBINES SYMMETRY OF CONSTRUCTION  
WITH GREATER POWER "IT'S STERLING VALUE"

GEAR DRIVEN.  
TIGHT AND LOOSE PULLEY.

GRAVITY FEED.  
AUTO-MATIC SHUT OFF.

IT'S IMPROVEMENTS MAKE IT A GREAT STEP IN  
ADVANCE OF ANY OTHER POWER HACK SAW.  
BE CONVINCED - GET OUR CIRCULAR.

**DIAMOND SAW & STAMPING WORKS**  
BUFFALO, N.Y., U.S.A.

May 3rd, 1906.

Buffalo Forge Co.,  
Buffalo, N. Y.

Dear Sirs:—

In reply to your letter of recent date, will say that I purchased one of your No. 200 Buffalo Blowers of Cray Bros., Cleveland, Ohio. I have used it one week and find it way ahead of any blower I ever used. Can say I am well pleased that I decided in favor of the Buffalo.

Yours truly,

W. A. Geer,  
Route No. 2, Albion, Pa.

## LIGHTNING GASOLINE ENGINES



**Steam Cooled  
Double Piston  
No Foundation**

Send for Catalogue  
Showing Superior  
Points, and get  
Prices

**KANSAS CITY HAY PRESS CO.** 482 Mill St.,  
Kansas City, Mo.

### INVESTIGATE THE Hercules Hydraulic

**Before  
You  
Buy a  
Tire Setter**



**National Machine Co.**  
KEOKUK, IA.

### Henderson <sup>Hand Power</sup> TIRE SETTERS

Set Tires Cold.  
Keep the Dish right  
Tighten Wood Work  
Pull Broken Spokes  
Jump in New Spokes  
Are Money Makers



**Standard Tire Setter Co.**  
KEOKUK, IA.

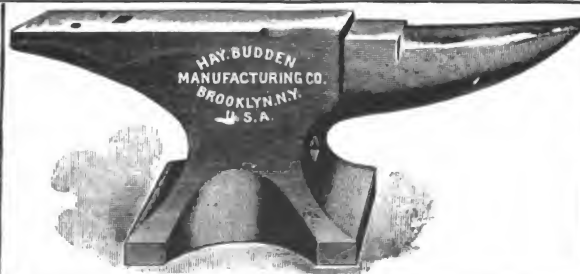
## HAY-BUDDEN SOLID WROUGHT ANVILS

**The Gold Medal Anvil  
Highest Award**

OMAHA, 1898 PAN-AMERICAN, 1901

Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS



OVER 100,000 IN USE

**WARRANTED**

Experience has proved their worth and demonstrated that "HAY-BUDDEN" Anvils are Superior in Quality, Form and Finish to any on the Market.

**HAY-BUDDEN MFG. CO., BROOKLYN, N. Y.**

# AMERICAN BLACKSMITH

BUFFALO  
N.Y. U.S.A.

A Practical Journal of Blacksmithing and Wagonmaking

AUGUST, 1906

\$1.00 A YEAR  
10¢ A COPY

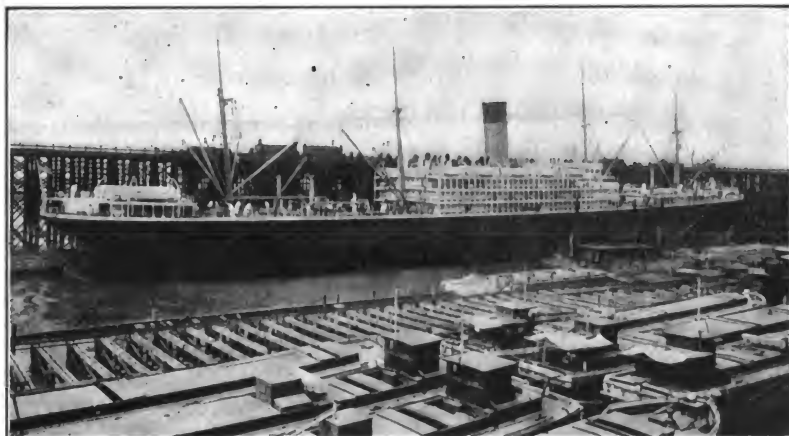
## A PERFECT SMITHING COAL

THE CONSOLIDATION COAL COMPANY'S  
GEORGE'S CREEK CUMBERLAND

Leads the World for General Smithing Purposes

Noted for its maximum heat producing power, its low sulphur and ash. Cokes promptly in the forge, forming a strong hard coke. This permits the formation of a very large arch, sufficient to cover work of any size which can be handled on the anvil. If you would have good, clean welds free from sulphur,

GIVE OUR COAL A TRIAL.



S. S. MINNESOTA.  
Receiving 5000 Tons Consolidation Smithing Coal for the Pacific Coast.

Our Transportation Facilities are Unsurpassed.  
Prompt Attention to All Orders.

No Other Coal Mined is Capable of Doing  
the same Amount of Work.

## THE CONSOLIDATION COAL CO.

F. W. WILSHIRE, Gen'l Manager of Sales  
1 BROADWAY, NEW YORK

E. M. MANCOURT, Western Manager  
MAJESTIC BLDG., DETROIT.

BOSTON  
R. C. GILLESPIE, Manager  
State Mutual Building

NEW YORK  
J. E. PARSONS, Manager  
1 Broadway

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W. M. WILSHIRE, Manager  
Land Title Building

BALTIMORE  
CHAS. Von H. KALKMAN, Manager  
Continental Trust Building

WASHINGTON, D. C.  
W. A. LEETCH, Manager

CINCINNATI  
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Traction Building

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A. E. WILLIAMS, Agent  
Western Reserve Building

CHICAGO  
NORTHWESTERN FUEL CO.  
Fisher Building

ST. PAUL, MINN.  
NORTHWESTERN FUEL CO.  
Pioneer Press Building

WHEN the "Silver" tools for Carriage Makers and Blacksmiths get busy they do their work so neatly, so accurately and so economically that every new user advertises us through pure delight over his discovery of their superior merits. Every well-informed, up-to-date mechanic knows

## The Economy of Perfect Tools

And our tools are "perfect" when it comes to actual results. Some advertisers try to hide the poor qualities of their inferior machines by mere force of figures and space. They deliver great broadsides through the magazines.

They sell goods—of course they do, but—*their customers do not advertise them.* When people get burned they stay away from the fire. But OUR customers advertise us because they get QUALITY—genuine, down-right *quality.* That's what counts.

*We haven't been mixing expert brains with the best materials all these years for nothing.* It counts a whole lot.

If YOU are desirous of the very best labor- and money-saving things in the carriage making or blacksmith lines,

Send for Booklet, "Carriage Maker and Blacksmith Tools."

It will come by return mail. It tells all about Hub-boring Machines, Hollow Augurs, Tenon Machines, Band Saws, Portable Forges, Swing, Post and Bench Drills, gives prices, weights of different sizes, etc., and illustrates fully and freely.

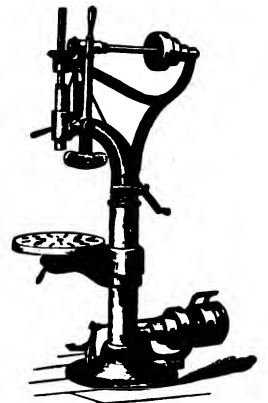


Fig. 850.  
SILVER'S  
BASE DRILL.

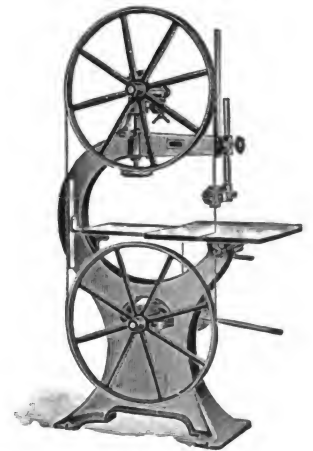


Fig. 822.  
SILVER'S POWER  
BAND SAW.

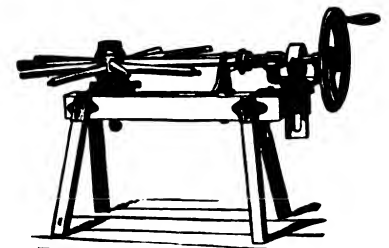


Fig. 718.  
SPOKE TENON MACHINE.



Fig. 925.  
SILVER'S PORTABLE FORGE.

MANUFACTURED BY

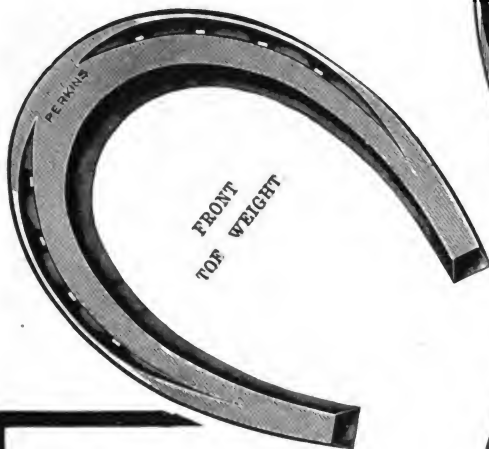
# The Silver Mfg. Co.

365 BROADWAY,

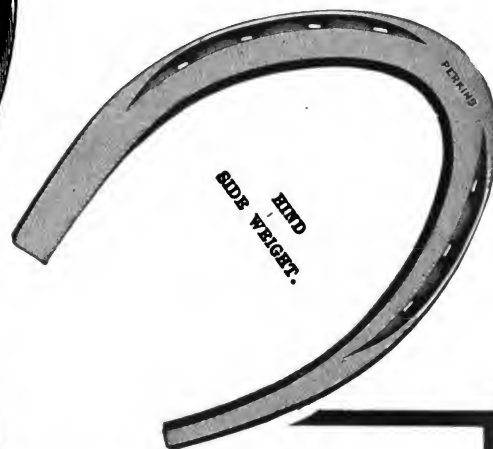
Salem, - Ohio.



★PERKINS★  
HORSE SHOES  
AND  
TOE CALKS  
THE STAR BRAND



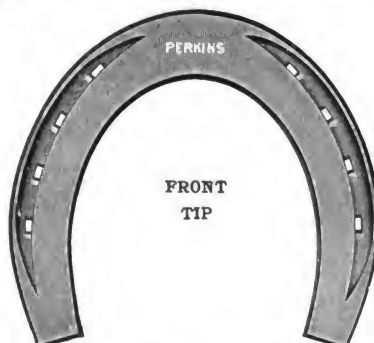
★PERKINS★  
HORSE SHOES  
AND  
TOE CALKS  
The SUPERIOR Kind



PERKINS  
SHOES

Have more points of superiority than any other make. An up-to-date shoe for up-to-date Blacksmiths. .

OUR  
Complete  
Catalogue  
SENT FREE.  
Write Today.



PERKINS  
SHOES

Are acknowledged by all users to have no equal. Made in all Styles and Sizes. Sold at Reasonable Prices.

Send  
for Samples New  
Pattern Front  
Extra Light and Light.  
Free for asking.

**PERKINS**

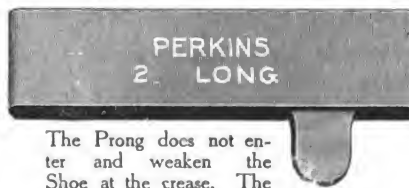
Made in Medium and Long, both blunt and sharp. Packed in 25 lb. boxes.



The Steel (our own make) is best suited for Calks; welds with sand and wears well. Perfectly graded in Length and Size.

**TOE CALKS**

Chisel Pointed Prong. These cuts show exact size of No. 2. SAMPLES SENT FREE.



The Prong does not enter and weaken the Shoe at the crease. The only slightly curved Calk sold.

—MANUFACTURED BY—

**RHODE ISLAND PERKINS HORSE SHOE COMPANY**  
PROVIDENCE, RHODE ISLAND.

# No. 16 = Western Chief Drills = No. 17

## DESCRIPTION

Hand Lever Feed, also Horizontal, Gear Driven Positive Self Feed, changeable instantly to fast, slow or medium speed as desired. These feeds work independent of each other and bit is lifted quickly.

### Cut Gears.

Raise and lower device to table

Drills to center of 24-inch circle.  
Bores from 0 to 1½ inch.  
Takes Bits ½ or 41-64 Shank as ordered.

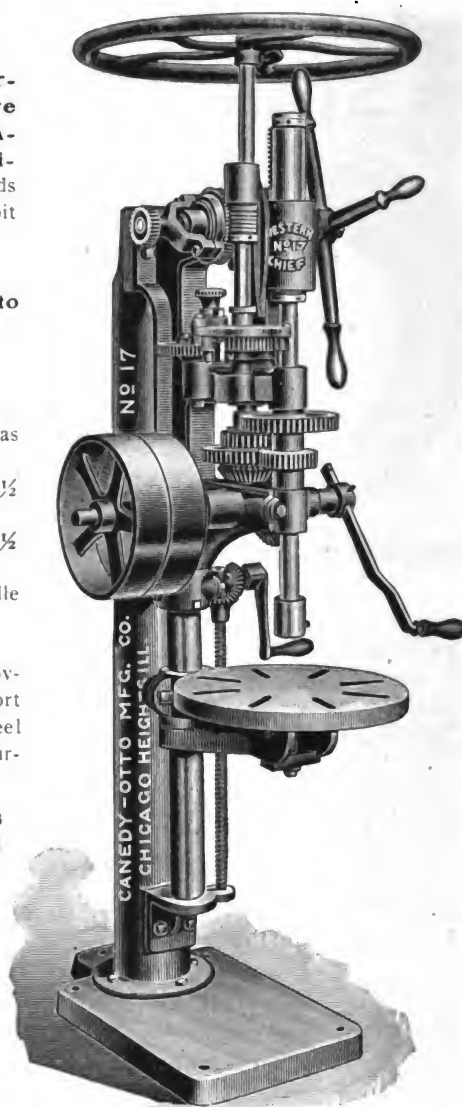
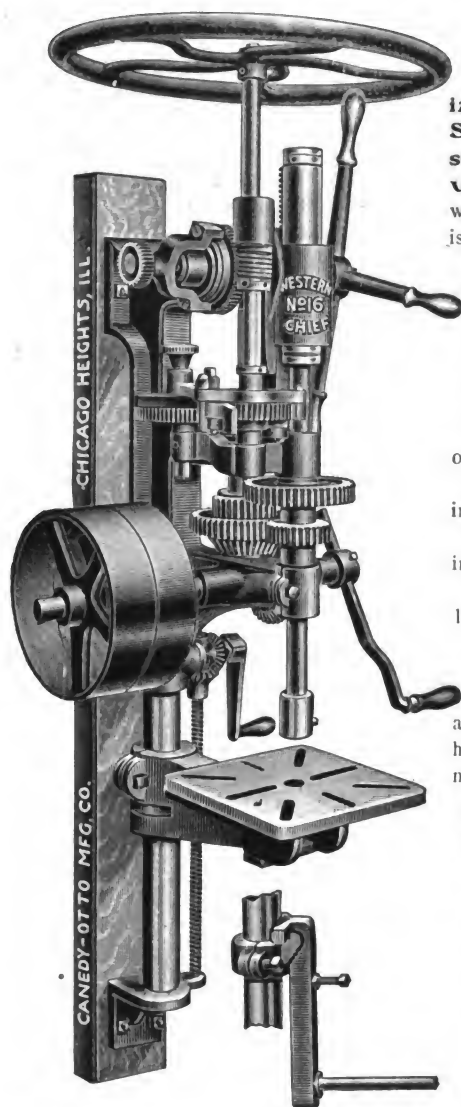
Spindle has up and down run of 8½ inches.

Table has up and down run of 15½ inches.

Greatest distance from table to spindle 18½ inches.

Wheel rims can be drilled by removing table and using the forked support as a wheel holder. A special wheel holder attachment as illustrated is furnished when desired.

No. 16, Weight 360 pounds  
No. 17, Weight 560 pounds



## Royal Blower

"The Successful Blower"

Gear case is oil-tight and dust-proof. Gears run in a continuous bath of oil. No spiral gears, worm gears or ball-bearings. Crank turns forward or backward. Fan 12 inches. Weight 135 pounds.

Fire pot is 8x9 1-2x4 inches inside.  
Needs no Clay.



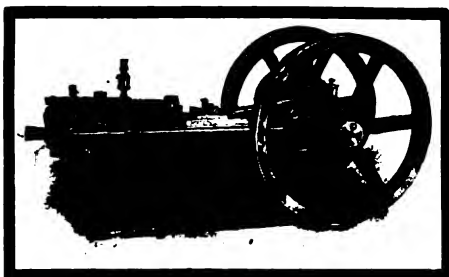
Some  
"Popular Tools"

Made by

**CANEDY - OTTO  
MFG. COMPANY,**

Chicago Heights, Ill.

FOR SALE BY  
First-Class Dealers  
EVERYWHERE.



## GET A GOOD ENGINE

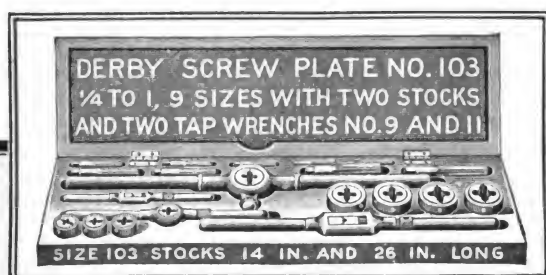
To run your shop. Don't buy a cheap unreliable make, but get a first class machine, one that is carefully constructed of the very finest material and fully guaranteed to give perfect satisfaction. The **ROBERTSON STRAIGHT LINE AUTOMATIC ENGINE** fills every shop requirement. It always runs smoothly, requires little attention and is the most economical power on the market. Has no batteries, coils, magnetos, hot tubes, etc., to give you trouble. Our Engines are most simple in construction and very easy to operate and take care of. Our engines are run on any grade gasoline or natural or artificial gas at a few cents per day. No coal or dirt. Equipped with all the latest improvements. Gives satisfaction wherever used.

Interesting Descriptive Circulars sent free to you. Drop us a card and we will send them at once.

Our Special Agents Offer is open in some sections. Write for our proposition today. Money in it. State size engine you require.

**ROBERTSON MFG. CO., BUFFALO, N. Y.**

**DON'T BUY AN ANVIL**  
UNTIL YOUR DEALER HAS SHOWN  
YOU THE **TRENTON**  
**IT SPEAKS FOR ITSELF**



### DERBY SCREW PLATES

Are widely known for their superior quality. They are the only cutting tools for the careful mechanic, for you can rely upon "Derby Tools" every time for a perfect job. They are unexcelled for strength, durability and accurate cutting properties. Sold by all leading dealers. We also make fine bicycle screw plates, taps and dies in every size, thread and assortment. A most complete line. Write for our catalogue. Sent free.

**BUTTERFIELD & CO.,**  
DERBY LINE, VT.  
Rock Island, Can.



## ALWAYS SHARP CALKS

Long conceded to be  
Without an equal.  
Any Dealer will tell  
You  
So.

Sold to the United States Government.  
Horseshoers who are progressive  
And "UP-TO-DATE"  
Recommend Always Sharp Calks because they are  
Practical, Efficient and Economical.

Calks that wear well  
And give satisfaction.  
Lead all other Calks.  
Known all over the world.  
Sample and testimonials on request.



**ALWAYS SHARP**  
**CALK MANUFACTURING CO.**

Jersey City, N. J.

# ECCLES BALL-BEARING COUPLINGS

## WITH LEATHER BUSHINGS

We make these Couplings in Buggy and Surrey sizes, and with Extension for Welding on an Axle Step.

Note how the Spring is fastened at the front end by a pivot, so that it can be TURNED FORWARD out of the way, while clipping the Coupling on the Axle.



PATENTED NOV. 25, 1902.

We make Wide Center Clips, both 5-16 and 3-8, and Square Clips for use with these Couplings, also Solid Forged Step Shank Clips.

The ease with which our Couplings are put on will save you money.

WE ARE MANUFACTURERS OF A FULL LINE OF  
**CARRIAGE AND WAGON FORGINGS**

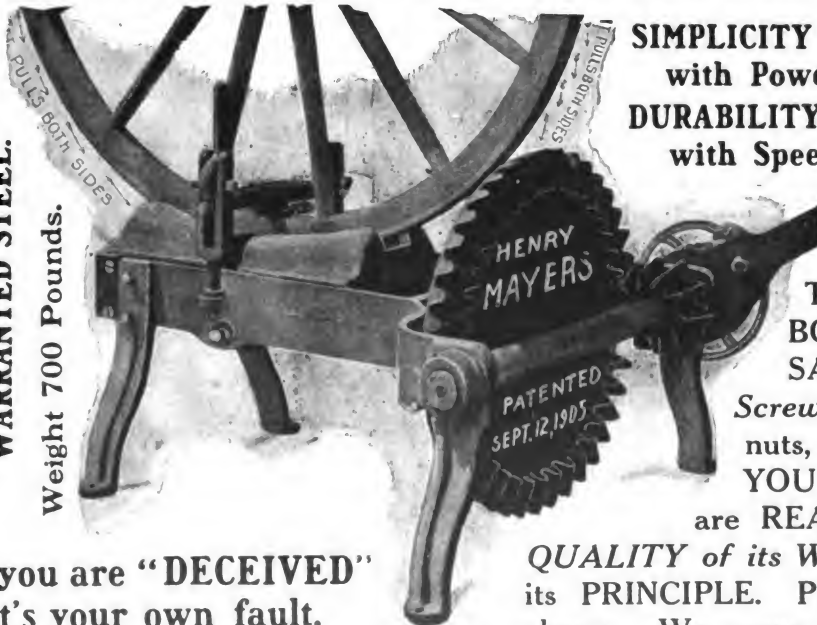
**RICHARD ECCLES CO.**

**Auburn, N. Y.**

## MAYERS COLD TIRE SETTER.

EVERY OUNCE, PIECE and PART  
WARRANTED STEEL.

Weight 700 Pounds.



SIMPLICITY  
with Power.  
DURABILITY  
with Speed.



If you are "DECEIVED"  
it's your own fault.

"WE ARE FROM MISSOURI AND ARE  
READY TO SHOW YOU."

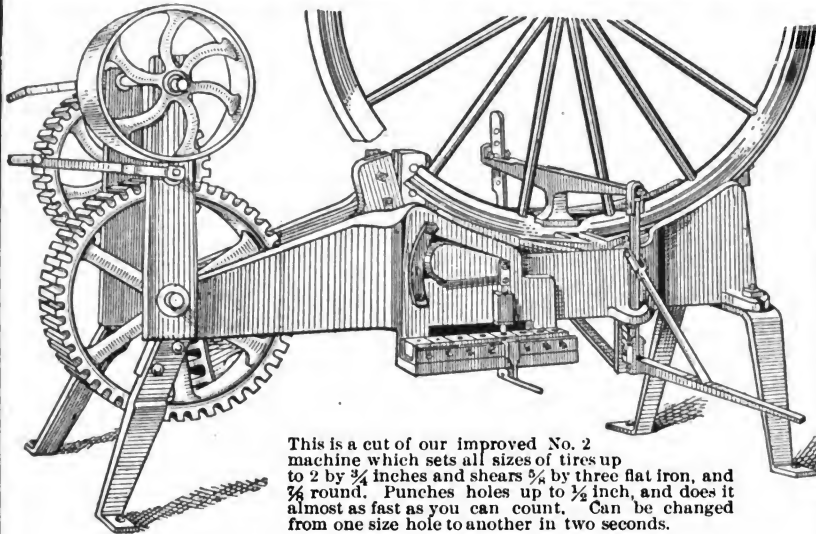
The PRINCIPLE of bringing BOTH HEADS together at the SAME TIME by means of a Screw with Right and Left handed nuts, by Powerful bevel gears, YOU can see, is RIGHT. WE are READY TO PROVE that the QUALITY of its Work is even BETTER than its PRINCIPLE. Put us to the Test. Talk is cheap. We mean business and have a plain proposition to offer.

**HENRY MAYERS MACHINERY CO.,**

1721-23 North Eighth St.,

**ST. LOUIS, MO.**





This is a cut of our improved No. 2 machine which sets all sizes of tires up to 2 by  $\frac{3}{4}$  inches and shears  $\frac{3}{4}$  by three flat iron, and  $\frac{3}{8}$  round. Punches holes up to  $\frac{1}{2}$  inch, and does it almost as fast as you can count. Can be changed from one size hole to another in two seconds.

## THE IMPROVED HOUSE COLD TIRE SETTER

Our No. 2 improved machine has both hand and power attachments and easily sets all ordinary tires up to 1 by  $4\frac{1}{2}$  inches, and shears 1 by 5 flat iron,  $1\frac{3}{4}$  round, and cuts off axles up to  $1\frac{1}{2}$  square and will punch all size holes up to  $\frac{3}{8}$  in.

By using the tire setter frame for shear and punch we produce same with little additional cost, and we therefore make each customer a present of a shear and punch worth at least \$80.00.

We have thousands of our machines in use and none of them are broken up, or worn out or abandoned. They cost nothing to keep in repair, and they do the work right. The heads move with the circle of the wheel, pulling the tire from both ways evenly, not injuring the felloes. Tire Setters where the heads move back and forth on a straight line; for instance, when their heads are apart to receive the wheel,

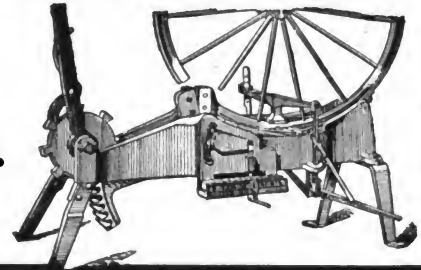
the tallest one will fit down on them, but when closed as in shrinking, the curve in the heads just fits an ordinary wheel. You know the consequences if you close in the circle of a portion of a tall wheel to the circle of a small one. Don't let them deceive you.

We have the only successful grip-keys and the only successful way for adjusting the same, both of which are patented. Others who claim to have our grip-keys are only using what we have thrown away.

Write us for catalogue and prices of our old style as well as our new machines.

## HOUSE COLD TIRE SETTER CO.

Office and Factory 216-220 S. Third St., ST. LOUIS, MO.

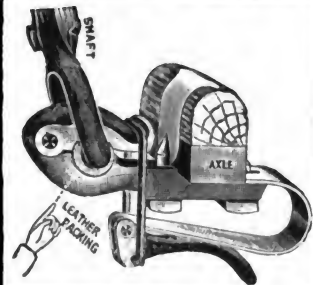


## SEE THE LEATHER PACKING

PATENTED

The  
leather  
packing in

the *Bradley Shaft Coupling* does the business—stops the rattle—lessens the friction and wear—and lengthens the life of the Coupling. In the *Bradley* only the leather packing wears, and the Coupling will perform the service for which it was intended as long as the carriage itself



THE **BRADLEY**  
SHAFT COUPLING

**C. C.  
BRADLEY  
& SON**  
SYRACUSE, N. Y.

## MORGAN & WRIGHT PADS ARE GOOD PADS

### Ask Any Blacksmith Who Uses Them.

Ten to one he'll tell you that these pads do more for his bank account than any pads he has ever used.

And he'll tell you, too, that horse owners are also mightily well satisfied with them, and that these owners come back to him repeatedly for the same brand of pads—something they would not do if the pads did not wear well and "do the business."

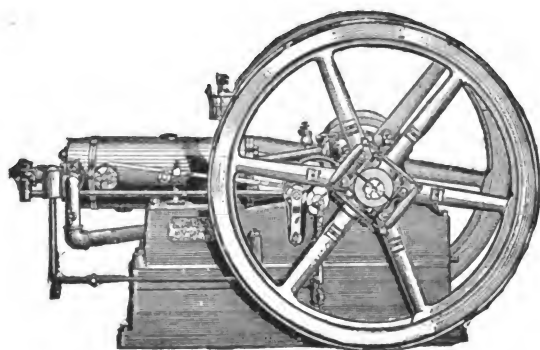
We know these things are true because horseshoers have told us so.

And horseshoers ought to know what pads are profitable and what are not.

Try them yourself next time you order.

### MORGAN & WRIGHT, Chicago,

New York    Dayton    Detroit    Atlanta    St. Louis    San Francisco



## The I. H. C. GAS AND Engine

The power you need for your Trip Hammer, Tire Setter, Hub Borer, Blower, Grinding or Polishing Machinery, Wood Working Machinery, or any other kind of machinery.

### You Want Power that will Give Your Shop the Maximum of Capacity at the Minimum of Expense

An I. H. C. gasoline engine will accomplish this for you better than anything else because—

An I. H. C. engine will give you all the power you need as long as you need it and at any time you need it.

An I. H. C. engine will take less of your time to run it than any other engine because it is more simply constructed than others. There are no complicated parts to put the whole mechanism on a strike.

An I. H. C. engine produces more power per gallon of gasoline used than any other engine. The governor and throttle valve prevent any more gasoline being used than is absolutely necessary to carry the load.

An I. H. C. engine will save you more time, trouble and money than any other because you can *depend upon it* to do your work without costly delays.

The I. H. C. engines are made in the most adaptable style and in all sizes. You can select one that will exactly meet your requirements.

Horizontal Engines: Stationary 4, 6, 8, 10, 12 and 15 H. P. Portable 6, 8, 10, 12 and 15 H. P.

Vertical 2, 3, and 5 H. P.

Write for catalogue giving all details and showing why you will serve your own best interests by installing an I. H. C. engine.

## THE INTERNATIONAL HARVESTER COMPANY OF AMERICA,

(INCORPORATED)

No. 7 U Monroe St., CHICAGO, Ill.



*Reinforced*

PATENT APPLIED FOR

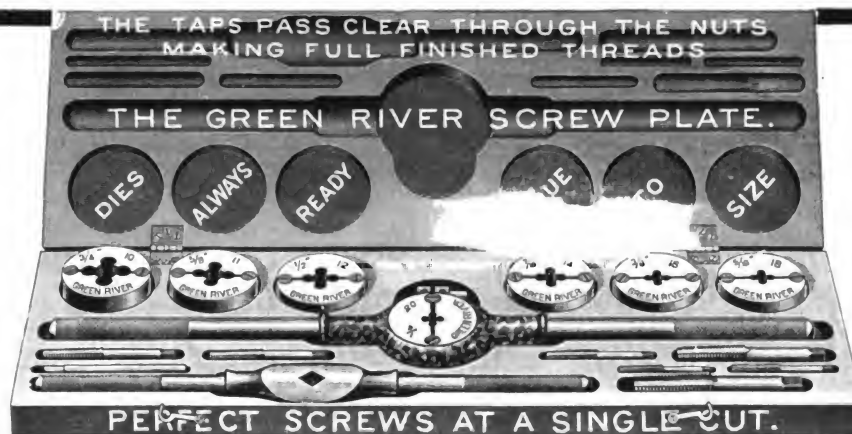
**DIAMOND**  
*Welds*

USED ON ALL OUR POLES AND SHAFTS.

**THE PIONEER POLE & SHAFT CO.**  
**PIQUA, OHIO.**

SEND FOR POLE AND SHAFT CATALOGUE AND PRICES.

F.C. HARRIS & CO. Cin. O.



## THE GREEN RIVER SCREW PLATE

Is your Screw Plate worn out? If so let us tell you the cost of a new one. If you have a Green River Screw Plate and the taps and dies are worn or broken, write us and we give you cost of new ones.

Send for Catalogue No. 33D giving full description.

We also make Punching Presses, Drilling Machines, Bolt Cutters and Tire Shrinkers.

**WILEY and RUSSELL MFG. CO.,** GREENFIELD, MASS.,  
U. S. A.

CORRUGATED PATTERN.

**The Horse Nail Which Meets All the Requirements, Stands Every Test Successfully and Satisfies Blacksmiths is "The Capewell."**

**"I Consider Your Nail the Best That Money Can Buy."**

GREAT BEND, N. D.

THE CAPEWELL HORSE NAIL CO.,  
Hartford, Conn.

DEAR SIR:

I feel that I owe you a few words of praise for your first-class nails, as I have tried nearly all kinds and find yours the only nail I can drive in **these hard feet of our western horses** without bending the nail or splitting the hoof, and, best of all, every nail clinches without breaking one of them. I consider your nail the best that money can buy.

Yours truly,

THE GREAT BEND IRON WORKS,  
Chas. Tritten, President.

**"The Capewell" can be used successfully in hot and dry climates where a large proportion of other Nails bend in driving and are wasted.**

PLAIN PATTERN REGULAR HEAD.

PLAIN PATTERN CITY HEAD.

Made by **The Capewell Horse Nail Company**  
**HARTFORD, CONN.**

The Largest Manufacturers of Horse Shoe Nails in the World.

## BRANCHES

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Chicago: . . . 238-240 Randolph St.  
St. Louis: . . . 12-14 North 12th St.  
New Orleans: . . . 736 Union St.  
Denver: . . . . . 1611 Blake St.  
San Francisco: **Santa Fe Warehouse, Spear St.**  
Portland: . . 554 Worcester Block.  
Toronto, Canada: . 50-56 Duke St.

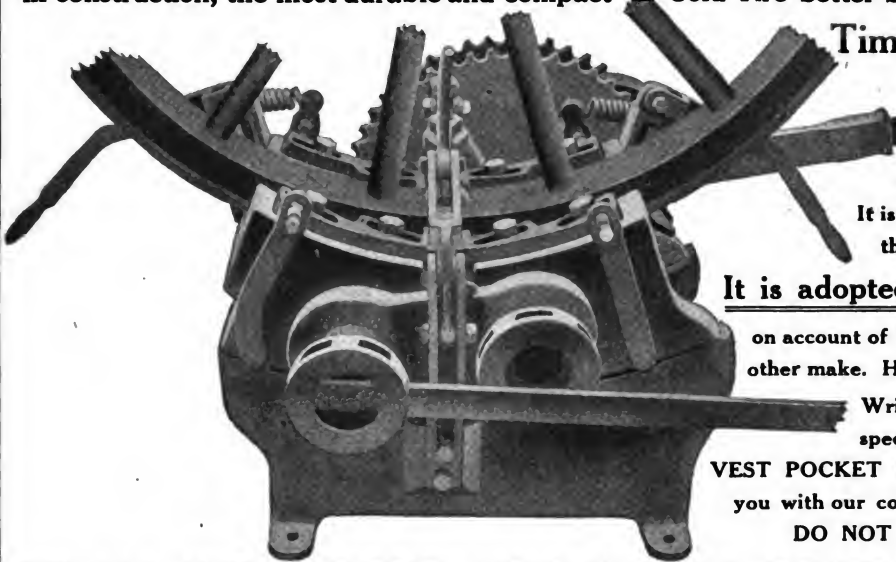
Catalogue Free upon Application.

PLATE PATTERN.



# YOU ARE THE MAN

Who would be setting the hundreds of tires that others are setting in your locality every year, if you had a BROOKS. It gets the business. It sets all sizes of tires by compressing the metal cold. It does the work in from two to five minutes. It is the only machine that has an automatic device for gripping the tires so that the keys will not slip. The BROOKS is the easiest operated, the strongest in construction, the most durable and compact Cold Tire Setter built.



## Time and Experience Must Precede Perfection

The BROOKS is built by the oldest manufacturers of edge grip machines. It is the superior of all others and receives the highest awards wherever shown.

## It is adopted by the Government Shops

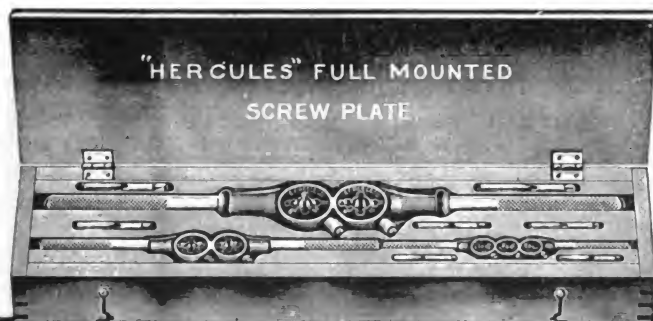
on account of its demonstrated superiority over every other make. Has no equal for rapid and accurate work.

Write us for DESCRIPTIVE BOOKLET, special terms and free trial, and a handy VEST POCKET MEMORANDUM BOOK will be sent you with our compliments.

DO NOT DELAY—WRITE TODAY.

**THE BROOKS TIRE MACHINE COMPANY**  
121 North Water Street, WICHITA, KANSAS.

## REECE HERCULES FULL MOUNTED SCREW PLATES



### WONDERFULLY STRONG FULLY GUARANTEED A NEW UP-TO-DATE LINE

Hercules Screw Plates have many strong points that are appreciated by the skilled mechanic. There is no changing of dies because a stock is furnished for every die and dies are always ready for instant use. Double stocks, a new idea of ours. All our stocks have Knurled Handles. The dies and taps in Hercules Screw Plates are the Celebrated Reece kind, fully guaranteed and the freest and most accurate cutting tools made. Hercules Screw Plates are not only the finest in quality, but the lowest in price as well and that's the kind you're looking for. The big demand for our goods enables us to sell at a small profit. The prices we can quote you on first-class screw plates will surprise you. WRITE TODAY for our Illustrated Catalogue and Price Lists. Free to you.

**THE E. F. REECE CO.,**

SOLE MANUFACTURERS

GREENFIELD

MASS., U. S. A.

# Little Giant

COMBINED

## Punch and Shear.

The Most Powerful Lever Punch and Shear Made.

5 Punches and Dies with Each Machine.

MADE IN THREE SIZES.

No. 1—Will punch  $\frac{3}{4}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{3}{4}$ -inch thick and 1-inch round. Weight, 515 lbs.

No. 2—Will punch  $\frac{1}{2}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{1}{2}$ -inch thick and  $\frac{7}{8}$ -inch round. Weight, 350 lbs.

No. 3—Will punch  $\frac{3}{4}$ -inch hole in  $\frac{3}{4}$ -inch iron. Cuts iron  $\frac{3}{4}$ -inch thick and  $\frac{3}{4}$ -inch round. Weight, 280 lbs.

Only ONE operation of the Lever does the work. No changing required.

Note the improved Stripper and Hold-down. This machine is made for the blacksmith shop, and we DO claim that it is decidedly the best on the market for that place.



For Sale by your Jobber. If not, Write Us. Send for Circular.

**Little Giant Punch & Shear Co., Sparta, Ill.**

# Buffalo 200 Blower

## Our Gilt Edge Guarantee

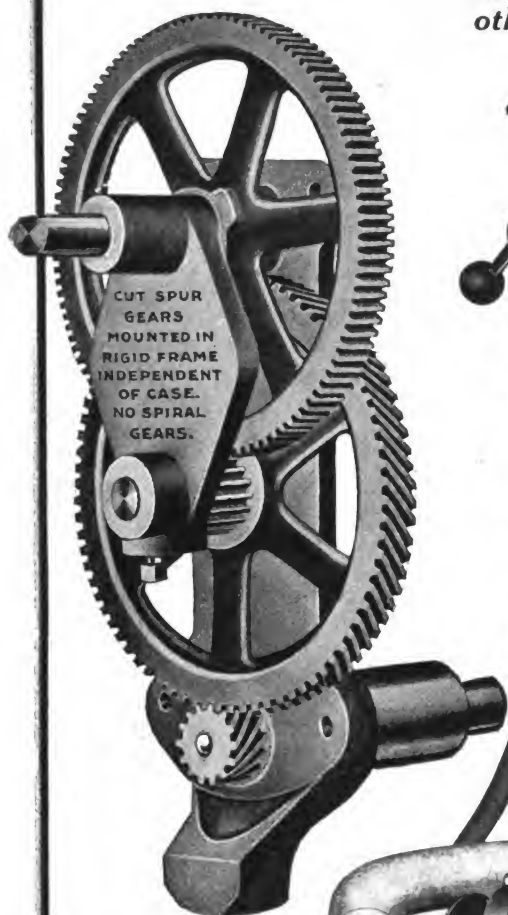
*In this Blower we offer you the guarantees given with all other blowers in the world. In addition we will replace, free of charge, any parts of Buffalo No. 200 Blower wearing out in five years. Can you buy any other blower with such a guarantee?*

**Gears**—Heavy, with large, strong, machine-cut teeth and finished on special machinery, cut spur and helical variety which reduces friction to the greatest possible minimum. Gears are enclosed in a cast-iron, dust-proof casing.

**Bearings**—Bored from solid castings and reamed to gauge, ensuring perfect alignment and smooth easy running.

**Oiling**—Gears run in oil which constantly keeps the working parts perfectly lubricated.

**Blast**—We positively guarantee the Buffalo No. 200 Blower to produce a stronger, more powerful blast, with the same number of turns of crank, and with less effort, than any other blower in the world.

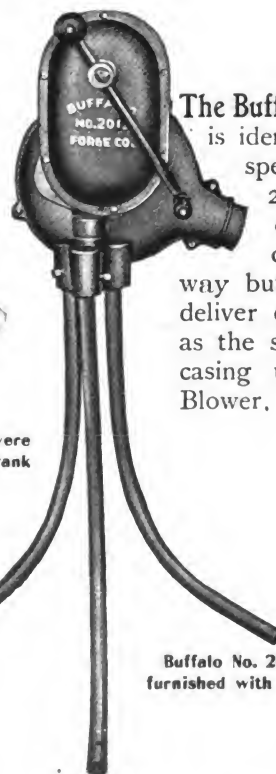


Gearing Used on Buffalo Nos. 200 and 201 Blowers.

Canadian friends:  
Save duty, buy of  
The Canadian  
Buffalo Forge  
Company,  
Montreal, Quebec.



Buffalo No. 200 Blower and new H. H. Tuyere which now goes with every machine. Crank turns in direction of arrow.



Buffalo No. 201 Blower furnished with H. H. Tuyere.

The Buffalo No. 201 Blower is identical in every respect with the No. 200 except the form of fan casing. The crank turns either way but blower does not deliver quite as much air as the standard scroll fan casing used on No. 200 Blower.

YOUR DEALER will place a BUFFALO NO. 200 BLOWER in your shop for free trial to demonstrate its superior qualities.

*Copy of our Latest illustrated Catalogue sent on request.*

# BUFFALO FORGE COMPANY,

BUFFALO, N. Y., U. S. A.



# AN HONEST BLACKSMITH

An honest Blacksmith gives his customers  
honest goods and fits up his shop with  
**HONESTLY MADE TOOLS.**

¶ It takes a full weight, rigid vise to turn out accurately made reliable goods.

¶ It takes a vise with a working surface polished to a mirror finish, carefully made of the best material, to continue giving the best of service for years and years.

¶ Ask for a "Columbian" "Original Trenton" Solid Box Vise, and get the only vise which has all of the good points we have mentioned.

¶ Ask for a "Columbian" All Steel Anvil, and you will receive a high grade anvil, correctly shaped, and made of best material, with finest temper.

¶ We can tell you more about "Columbian" Vises and Anvils, if you will drop us a postal, asking for Catalogue No. 16, and a trial order will prove that "Columbian" Vises and Anvils are best and cheapest.

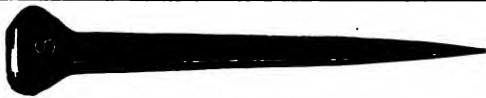
¶ Our Catalogue No. 16 tells just how heavy a standard vise should be, the correct width of jaws, etc. It will help you to get your money's worth when you buy.

¶ Send for it today.



**THE COLUMBIAN HARDWARE CO.**  
MANUFACTURERS  
CLEVELAND, OHIO, U. S. A.





No. 8 REGULAR HEAD.—Exact size.

**"NEW STANDARD" HORSE NAILS**

The letter "S" appears on the head of each nail.



No. 8 CITY HEAD..

Exact size.

**Best Nail in the World BAR NONE.****DEALERS' NET PRICES TO SHOERS.**

No.....	5	6	7	8	9	10	11	12
Box.....	\$4.75	4.00	3.75	3.50	3.25	3.25	3.00	3.00
Lb.....	.19	.16	.15	.14	.13	.13	.12	.12

FOR SALE BY ALL DEALERS.

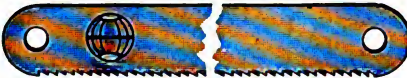
Uniform Horse Nails. In length, breadth, thickness, blades, points, quality and PRICE, and the best driving and holding nail ever produced.

We mean every statement made above.

Manufactured and Guaranteed by

**STANDARD HORSE NAIL CO., New Brighton, Pa.****Your Hack Saw Troubles**

will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



**West Haven Manufacturing Co.**  
NEW HAVEN, CONN.

**Electric Forge Blowers**  
**Excel All Others**

A Good  
Blower  
That  
Blows  
Every-  
body  
Good.



MODERN MACHINERY  
MAKES THE SMITH'S  
WORK LIGHTER

**ROTH BROS. & CO.**

21-29 No. Clinton Street,  
CHICAGO, ILL.

Write  
for  
Prices  
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Circulars

**NATIONAL SELF-OILING STEEL TUBULAR AXLES**

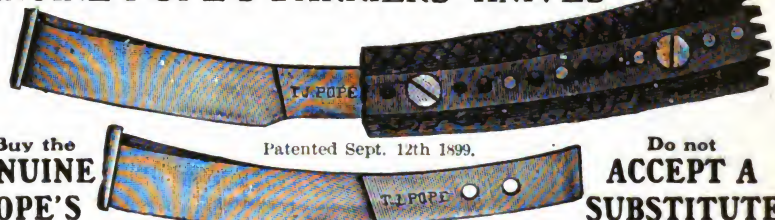
Now made  
of high  
carbon steel.



Guaranteed to be stronger and more rigid than  
solid steel axles. We make both. Write us

**National Tubular Axle Co., EMIGSVILLE, PA.****GENUINE POPE'S FARRIERS' KNIVES**

Buy the  
**GENUINE**  
**POPE'S**



Patented Sept. 12th 1899.

Do not  
**ACCEPT A**  
**SUBSTITUTE**

The handles of the GENUINE POPE'S KNIVES are now made with the notched end shown above. All such bear the maker's name, T. J. POPE. All genuine Blades are stamped PAT. SEPT. 12, 1899.

For Sale by dealers in Blacksmiths' Supplies Everywhere, **SOLE AGENTS,****WIEBUSCH & HILGER, LTD., 9 to 15 Murray Street,**

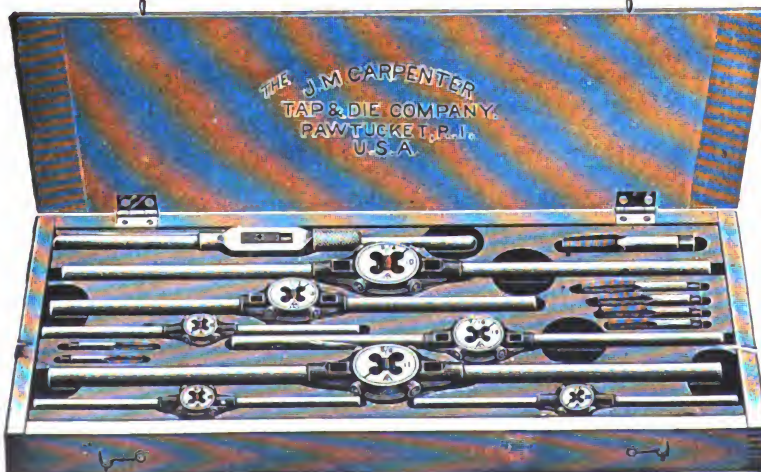
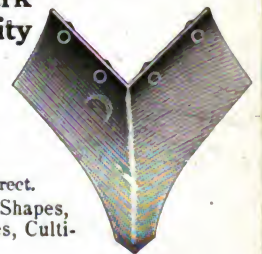
San Francisco Office, 105 Front St., Hughson &amp; Merton.

**New York.****"CRESCENT" The Mark of Quality****Insist on the "Crescent"**

brand and if your jobber cannot supply you write us direct.

We manufacture a full line of High Grade Agricultural Steel Shapes, Fitted and Bolted Plow and Lister Shares, Merchant Plow Shares, Cultivator Blades, Subsoiler Blades, Landsides, etc., etc.

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**CRESCENT FORGE & SHOVEL CO., Havana, Ill., U. S. A.****CARPENTER'S NEW FULL MOUNTED DIE SETS**

With a stock for each die and the Original Nichols Tap Wrench.

Before buying a die set you should see **Carpenter's** and you will have no other make.

Send for catalogue

**The J. M. Carpenter Tap & Die Co.**

Pawtucket, R. I., U. S. A.



## SAVE The Dealer's Profits

### BUY WHEELS DIRECT FROM THE FACTORY

We can save you money on all sizes of wheels; in the white, painted any color and with steel or rubber tires. We bore wheels for boxes without extra charge. Give us a trial order and we will make you one of our many satisfied customers. Write for special prices to *American Blacksmith* readers.

**Carriage Wheel Supply Co.**  
UNION CITY, IND.



DOES THE  
PAINT SHOP  
PAY  
?

YES—IF YOU USE  
**BUCKEYE PAINTS AND  
VARNISHES**

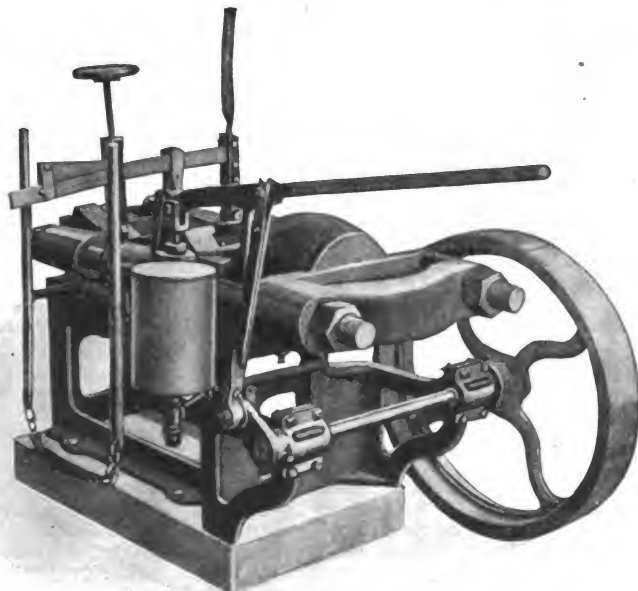
We can quote you interesting prices on paints, colors and varnishes — prices that will save you much money when you are buying your supplies.

**Buckeye Paint and Varnish Co.**  
—Toledo, Ohio.—

Our carriage paints are ground in fine coach varnish of our own manufacture. Dries quickly with a handsome gloss and durable finish. Every gallon guaranteed. Buckeye paint and varnish remover saves money and also saves labor. LEAVES A NICE CLEAN SURFACE.

## The **SCIENTIFIC** Cold Tire Setter

Sets Tires Cold by a few Strokes of a  
**POWERFUL HYDRAULIC PUMP**  
It can be Worked by Hand or Power



It has steel head blocks that cannot be broken.

It has tool steel gripping blocks that can easily be retempered.

It has an automatic device for adjusting the gripping blocks to the circle of any height of wheel.

It has a quick gripping arrangement to grip the tires instantly without the use of a hammer.

It releases its grip instantly when tire is set.

It is **WARRANTED** to SET TIRES **EASIER AND QUICKER** than any other edge grip machine made.

You'll be sorry if you don't buy one.

It is sent on trial. Send for descriptive Catalogue.

**Standard Tire Setter Co.**  
**KEOKUK, IOWA.**

This Cut Shows the **SCIENTIFIC** with Power Attachment

## Cortland Welding Compound Co.

CORTLAND, N. Y.

Manufacturers of

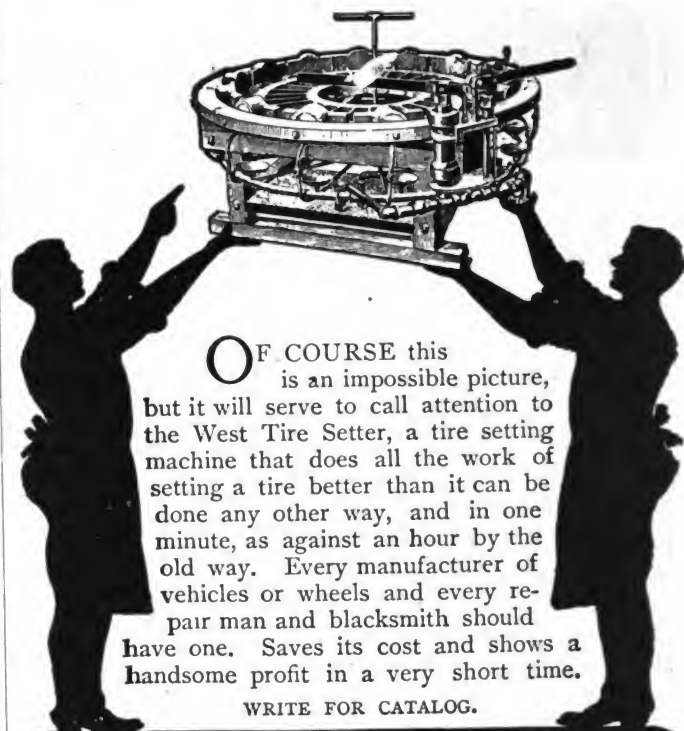
**Climax Welding Compound,  
Cherry Heat Welding Compound,  
and BORAX-ETTE.**



**B**ORAX-ETTE makes steel weld easily. It does not have to be applied between the laps like other compounds, but is used the same as borax. It has no equal for all kinds of steel welding.

**SAMPLES FREE.**

FOR SALE BY DEALERS IN **BLACKSMITHS' SUPPLIES**



**O**F COURSE this is an impossible picture, but it will serve to call attention to the West Tire Setter, a tire setting machine that does all the work of setting a tire better than it can be done any other way, and in one minute, as against an hour by the old way. Every manufacturer of vehicles or wheels and every repair man and blacksmith should have one. Saves its cost and shows a handsome profit in a very short time.

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**The West Tire Setter Co.  
Rochester, N.Y.**



**STEEL STAMPS**  
Steel Letters and Figures  
**BURNING BRANDS**  
Stencil Dies, Stencils, Etc.

**Geo. M. Ness, Jr.,**  
61 Fulton Street, N. Y.  
Price List sent upon application.



**ALLEN-  
RANDALL  
BOLT CLIPPER**



ALLEN-RANDALL CO., Springfield, Mass.

**TRY THEM**

## RUBBER TIRES

Strictly First Quality.

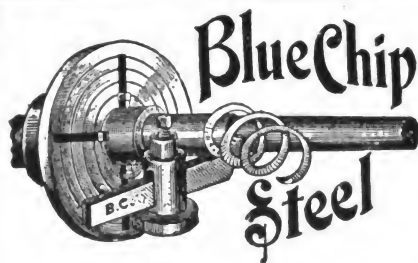
When Cash accompanies order, Price,

Per set for size 1 1/4 inch..... \$14.50  
Per set for size 1 3/4 inch..... 17.00  
Per set for size 1 1/2 inch..... 21.00

**WRITE FOR SAMPLES**

—ADDRESS—

**The A. Armstrong Co.,**  
719-723 State Ave.,  
CINCINNATI, OHIO, U. S. A.



Will turn off blue chips  
on any kind of work.

**Firth-Sterling Steel Co.  
PITTSBURGH.**

Selling Agencies:

**NEW YORK CHICAGO  
BOSTON PHILADELPHIA**



Special Net Price on Sarven Patent Wheels  
(C. B. Soc. extra) with steel and rubber tire

Size of tread	Price per set for wheels with flat steel tire on and hubs bored	Price per set for wheels complete with channel and rubber tire on, and hubs bored	Add to price of wheels for axles and boxes set
3/4	\$5.75	\$13.50	\$14.00
1 1/8	5.85	14.50	15.00
1 1/4	6.10	16.00	16.75
1 1/2	8.25	24.00	25.00

Repair Wheels, \$3.00

PROMPT SHIPMENTS. Five or more, one order, you can deduct 25% per set as freight allowance. Write for catalogue. We manufacture wheels with Steel or Rubber Tire on 3/4 to 4 inch tread. Buggy Gear with wheels and shaft all ready for body, \$10.00.

**The A. Boob Wheel Co., Cincinnati, O., U. S. A.**

## Morse Twist Drill & Machine Co.

NEW BEDFORD, MASS., U. S. A.

We make and carry in stock various styles of Arbors, Reamers, Chucks, Counterbores, Countersinks, Dies, Three and Four Groove Drills, Drills with Oil Holes, Jobbers' Drills, Letter Drills, Wire Drills, Gauges, Mandrels, Metal Slitting Saws, Cutters with Solid and inserted Teeth—Axial, Radial, Angular, Form and Gang Cutters; a full line of Taps, Adjustable Tap Wrenches, Opticians', Model Makers' and Machinists' Screw Plates and Dies, Solid Pipe Dies and Solid Machine or Bolt Dies, Tools for Turret Head Machines, and many others; being made, as are all of our tools, of the best material and by the best workmen, their accuracy and effectiveness are assured.

# HAYSLER IRON CO., Kansas City, Mo.

## CHEAPEST BLACKSMITH SUPPLY HOUSE IN THE UNITED STATES.

Our No. 63 Catalogue will be sent free for the asking to any Blacksmith, Wagon Maker or other dealer in our line of goods

### XXX Round End Buggy and Express Singletree Woods.

1 1/4 x 1 1/4 x 40 in. long, 3X each	.09, doz...	.98
1 1/4 x 2 x 40 in. long, 3X each	.09, doz...	.98
1 1/4 x 2 x 40 in. long, 3X each	.10, doz...	.98
1 1/4 x 2 1/4 x 40 in. long, 3X each	.13, doz...	1.30
1 1/4 x 2 1/4 x 40 in. long, 3X each	.14, doz...	1.60
1 1/4 x 2 1/4 x 40 in. long, 3X each	.16, doz...	1.65
1 1/4 x 1 1/4 x 38 in. long, for poles	.10, doz...	1.10

### Second Growth Round End Buggy and Express Singletree Woods.

1 1/4 x 1 1/4 x 40 in. long, each	.14, per doz.	\$1.54
1 1/4 x 2 x 40 in. long, each	.14, per doz.	1.54
1 1/4 x 2 x 40 in. long, each	.14, per doz.	1.54
1 1/4 x 2 1/4 x 40 in. long, each	.17, per doz.	1.96
1 1/4 x 2 1/4 x 40 in. long, each	.20, per doz.	2.17
1 1/4 x 2 1/4 x 40 in. long, each	.21, per doz.	2.25
1 1/4 x 1 1/4 x 38 in. long, each	.14, per doz.	1.54

### Oval Wagon Singletree Woods.

2 1/2 x 36 in. long, 3X, each	.10, per doz.	\$1.12
2 1/2 x 36 in. long, 3X, each	.11, per doz.	1.26
2 1/2 x 36 in. long, 3X, each	.12, per doz.	1.33
3 x 36 in. long, 3X, each	.16, per doz.	1.82
2 1/2 x 38 in. long, 3X, each	.17, per doz.	1.85
3 x 38 in. long, 3X, each	.18, per doz.	1.95
2 1/2 x 36 in. long, 2d growth, each	.16, doz.	1.75
2 1/2 x 36 in. long, 2d growth, each	.18, doz.	2.03
3 x 36 in. long, 2d growth, each	.21, doz.	2.45
2 1/2 x 38 in. long, 2d growth, each	.23, doz.	2.55
3 x 38 in. long, 2d growth, each	.25, doz.	2.80

### Round Wagon Singletree Woods.

2 1/2 x 36 in. long, 3X, each	.15, per doz.	\$1.68
2 1/2 x 36 in. long, 3X, each	.15, per doz.	1.68
2 1/2 x 36 in. long, 3X, each	.16, per doz.	1.75
2 1/2 x 36 in. long, 3X, each	.18, per doz.	1.96
2 1/2 x 38 in. long, 3X, each	.18, per doz.	1.96
3 x 36 in. long, 3X, each	.25, per doz.	2.80
3 x 38 in. long, 3X, each	.25, per doz.	2.80
2 1/2 x 36 in. long, 2d growth, each	.22, doz.	2.31
2 1/2 x 36 in. long, 2d growth, each	.22, doz.	2.31
2 1/2 x 36 in. long, 2d growth, each	.22, doz.	2.38
2 1/2 x 36 in. long, 2d growth, each	.22, doz.	2.38
2 1/2 x 38 in. long, 2d growth, each	.23, doz.	2.47
3 x 36 in. long, 2d growth, each	.30, doz.	3.43
3 x 38 in. long, 2d growth, each	.31, doz.	3.43

### Oval Plow Singletree Woods.

2 1/2 x 36 in. long, each	.07, per dozen....	.80
2 1/2 x 30 in. long, each	.07, per dozen....	.80
2 1/2 x 30 in. long, each	.10, per dozen....	1.08

### Square Center Express Singletree Woods.

2 1/2 x 38 in. long, 3X, each	.16, per doz.	\$1.75
2 1/2 x 38 in. long, 3X, each	.17, per doz.	1.82
2 1/2 x 38 in. long, 3X, each	.17, per doz.	1.96
2 1/2 x 38 in. long, 3X, each	.19, per doz.	2.17
2 1/2 x 38 in. long, 2d growth, each	.21, doz.	2.31
2 1/2 x 38 in. long, 2d growth, each	.24, doz.	2.52
2 1/2 x 38 in. long, 2d growth, each	.25, doz.	2.69
2 1/2 x 38 in. long, 2d growth, each	.26, doz.	2.80

### Rough Shaft Cross Bars.

1 1/4 x 2 3X, each	.10, per dozen.....	\$1.13
1 1/4 x 2 3X, each	.11, per dozen.....	1.22
1 1/4 x 2 1/4 3X, each	.12, per dozen.....	1.31
1 1/4 x 2 1/4 3X, each	.14, per dozen.....	1.44
1 1/4 x 2 1/4 3X, each	.15, per dozen.....	1.58

### Half Finished Shaft Cross Bars.

Full finished except ends, which are square, and tenons are not cut.

1 1/4 x 2 3X, each	.14, per dozen.....	\$1.40
1 1/4 x 2 3X, each	.15, per dozen.....	1.50
1 1/4 x 2 1/4 3X, each	.18, per dozen.....	1.80
2 x 2 1/4 3X, each	.25, per dozen.....	2.50

### Full Finished Shaft Cross Bars.

1 1/4 x 2 3X, each	.14, per dozen.....	\$1.40
1 1/4 x 2 3X, each	.14, per dozen.....	1.40
1 1/4 x 2 1/4 3X, each	.15, per dozen.....	1.50
1 1/4 x 2 1/4 3X, each	.16, per dozen.....	1.60
1 1/4 x 2 1/4 3X, each	.18, per dozen.....	1.80
2 x 2 1/4 3X, each	.25, per dozen.....	2.50
2 x 3 3X, each	.30, per dozen.....	3.00

### Hickory Wagon Doubletree Woods.

1 1/4 x 3 1/4 x 48 3X, each	.25, per dozen.....	\$2.93
2 x 4 248 3X, each	.25, per dozen.....	2.93
2 x 4 1/4 x 48 3X, each	.30, per dozen.....	3.58
2 x 5 1/2 x 48 3X, each	.40, per dozen.....	4.65
2 x 5 1/2 x 48 3X, each	.45, per dozen.....	4.87
2 1/2 x 4 1/2 x 48 3X, each	.45, per dozen.....	4.87
2 1/2 x 5 1/2 x 48 3X, each	.50, per dozen.....	5.53

### Black Hickory Wagon Doubletree Woods.

1 1/4 x 3 1/4 x 48, each	.30, per dozen.....	\$3.51
2 x 4 248, each	.30, per dozen.....	3.51
2 x 4 1/4 x 48, each	.36, per dozen.....	4.30
2 x 5 1/2 x 48, each	.46, per dozen.....	5.58
2 x 5 1/2 x 48, each	.50, per dozen.....	5.85
2 1/2 x 4 1/2 x 48, each	.50, per dozen.....	5.85
2 1/2 x 5 1/2 x 48, each	.60, per dozen.....	6.69

### Hickory Three Horse Doubletrees.

2 x 4 1/4 x 60 3X, each	.55, per dozen.....	\$6.38
2 x 4 1/4 x 60 Black Hickory, each	.70, doz.	7.66

### Hickory Four Horse Doubletrees.

2 x 5 1/2 x 72 3X, each	.50, per dozen.....	\$10.50
2 x 5 1/2 x 84 3X, each	.105, per dozen.....	12.42
2 x 5 1/2 x 72 Black Hick'ry, each	\$1.10, doz	12.60
2 x 5 1/2 x 84 Black Hick'ry, each	1.25, doz	14.91

### Flat Hickory Plow Doubletree Woods.

1 1/4 x 3 1/4 x 42 3X, each	.17, per dozen....	\$1.88
1 1/4 x 3 1/4 x 42 Black Hick'ry, each	.20, doz.	2.25

These prices are lower than you paid for your last bill of Wood Stock. Why not order your next bill from us? If we can furnish the same goods for less money, it is your duty to buy from us.

### Oval Hickory Plow Doubletrees.

1 1/4 x 2 1/4 x 38 3X, each	.16, per doz.....	\$1.82
1 1/4 x 2 1/4 x 38 Black Hickory, each	.19, doz.	2.18

### Hickory Buggy and Express Doubletree Woods.

1 1/4 x 2 1/4 x 48 3X, each	.18, per doz.....	\$2.03
1 1/4 x 2 1/4 x 48 3X, each	.18, per doz.....	2.03
1 1/4 x 2 1/4 x 48 3X, each	.18, per doz.....	2.10
1 1/4 x 2 1/4 x 48 3X, each	.19, per doz.....	2.17
1 1/4 x 2 1/4 x 48 3X, each	.22, per doz.....	2.45
1 1/4 x 3 3X, each	.21, per doz.....	2.45
1 1/4 x 2 1/4 x 48 Black Hickory each	.24, doz.	2.80
1 1/4 x 2 1/4 x 48 Black Hickory each	.24, doz.	2.80
1 1/4 x 2 1/4 x 48 Black Hickory each	.25, doz.	2.94
1 1/4 x 2 1/4 x 48 Black Hickory each	.26, doz.	3.08
1 1/4 x 2 1/4 x 48 Black Hickory each	.28, doz.	3.36
1 1/4 x 3 3X Black Hickory each	.30, doz.	3.60

### Second Growth White Hickory Buggy and Express Doubletree Woods.

1 1/4 x 2 1/4 x 48 each	.30, per dozen.....	\$3.50
1 1/4 x 2 1/4 x 48 each	.30, per dozen.....	3.50
1 1/4 x 2 1/4 x 48 each	.32, per dozen.....	3.85
1 1/4 x 2 1/4 x 48 each	.34, per dozen.....	4.06
1 1/4 x 2 1/4 x 48 each	.35, per dozen.....	4.20
1 1/4 x 3 3X each	.35, per dozen.....	4.20

### Hickory Wagon Nookyoke Woods.

2 1/2 x 38 3X, each	.15, per dozen.....	\$1.68
2 1/2 x 40 3X, each	.16, per dozen.....	1.82
2 1/2 x 42 3X, each	.20, per dozen.....	2.38
2 1/2 x 44 3X, each	.24, per dozen.....	2.80
3 x 48 3X, each	.34, per dozen.....	4.12

### Black Hickory Wagon Nookyoke Woods.

2 1/2 x 38 Black Hickory, each	.20, dozen	\$2.31
2 1/2 x 40 Black Hickory, each	.21, dozen	2.52
2 1/2 x 42 Black Hickory, each	.25, dozen	2.94
2 1/2 x 44 Black Hickory, each	.28, dozen	3.29
3 x 48 Black Hickory, each	.39, dozen	4.62

A "Square Deal" is all we want and a "Square Deal" is what we give. If you pay more for your singletree than the prices shown above you are not getting your money's worth. Look and see.

### Second Growth Wagon Nookyoke Woods.

2 1/2 x 38 2d Growth, each	.26, per dozen	\$3.08
2 1/2 x 40 2d Growth, each	.28, per dozen	3.39
2 1/2 x 42 2d Growth, each	.31, per dozen	3.71
2 1/2 x 44 2d Growth, each	.34, per dozen	4.06
3 x 48 2d Growth, each	.43, per dozen	5.74

### 3X Buggy and Express Nookyoke Woods.

1 1/4 x 44 3X, each	.21, per dozen.....	\$2.52
1 1/4 x 44 3X, each	.21, per dozen.....	2.52
1 1/4 x 44 3X, each	.21, per dozen.....	2.52
2 x 44 3X, each	.21, per dozen.....	2.52
2 1/2 x 44 3X, each	.24, per dozen.....	2.80
2 1/2 x 44 3X, each	.24, per dozen.....	2.80

### Black Hickory Buggy and Express Nookyoke Woods.

1 1/4 x 44 Black Hickory, each	.26, dozen	\$3.08
1 1/4 x 44 Black Hickory, each	.26, dozen	3.08
1 1/4 x 44 Black Hickory, each	.26, dozen	3.08
2 x 44 Black Hickory, each	.26, dozen	3.08
2 1/2 x 44 Black Hickory, each	.31, dozen	3.69
2 1/2 x 44 Black Hickory, each	.31, dozen	3.69

### Second Growth Hickory Buggy and Express Nookyoke Woods.

1 1/4 x 44 2d Growth, each	.33, per dozen	\$3.94
1 1/4 x 44 2d Growth, each	.33, per dozen	3.94
1 1/4 x 44 2d Growth, each	.33, per dozen	3.94
2 x 44 2d Growth, each	.33, per dozen	3.94
2 1/2 x 44 2d Growth, each	.36, per dozen	4.25
2 1/2 x 44 2d Growth, each	.36, per dozen	4.25

### 3X Hickory Wagon Load Bars.

2 1/2 x 42 3X, each	.27, per dozen.....	\$3.15
2 1/2 x 44 3X, each	.30, per dozen.....	3.55
3 x 48 3X, each	.43, per dozen.....	4.87

### Black Hickory Wagon Load Bars.

2 1/2 x 42 Black Hickory, each	.31, dozen	\$3.69
2 1/2 x 44 Black Hickory, each	.34, dozen	4.04
3 x 48 Black Hickory, each	.46, dozen	5.37

### Wagon Top Sials.

1 1/4 x 12 ft. long, each	.15, per dozen	\$1.60
2 x 12 ft. long, each	.16, per dozen	1.90
2 1/2 x 12 ft. long, each	.18, per dozen	2.00

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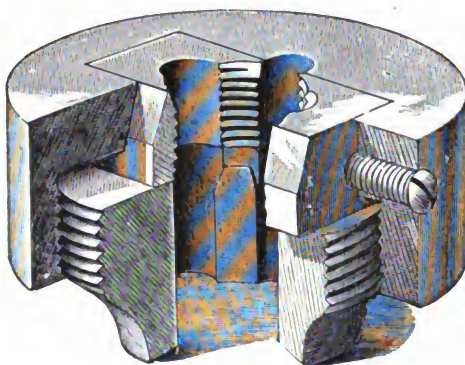
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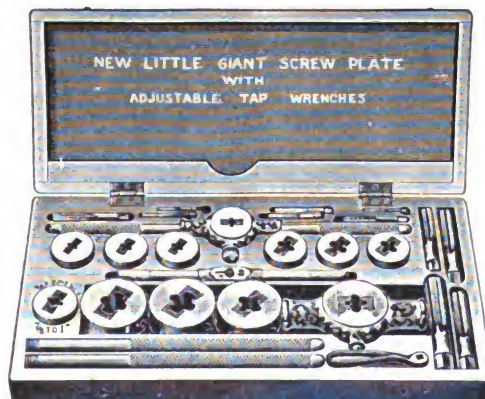
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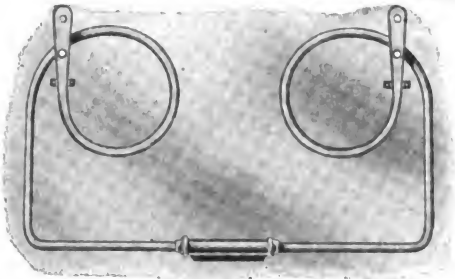
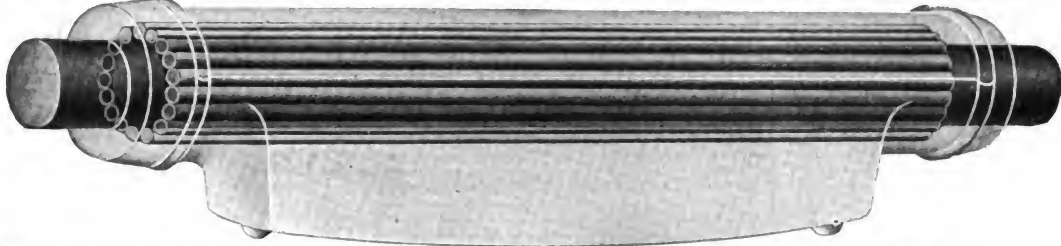
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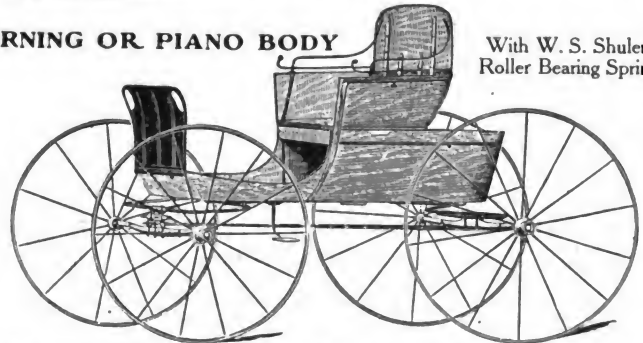
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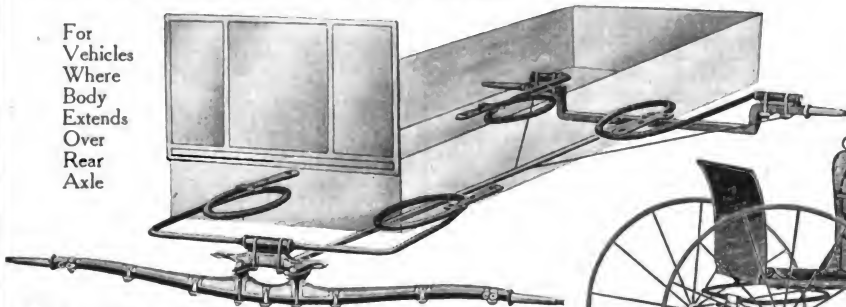
The Easiest Rider in Existence.  
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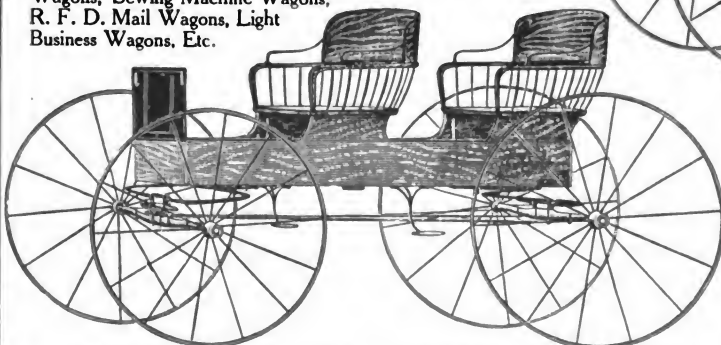
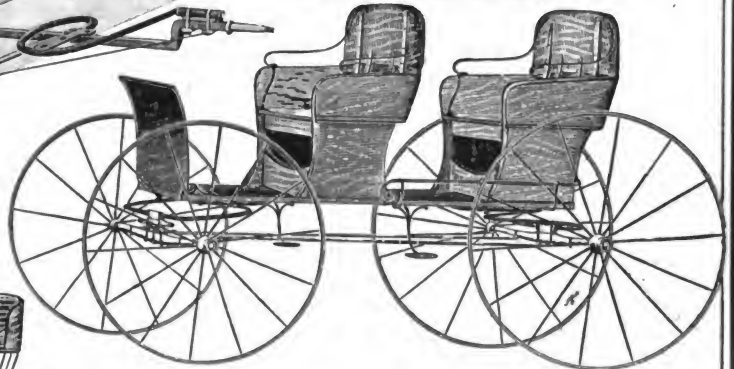
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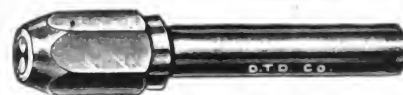
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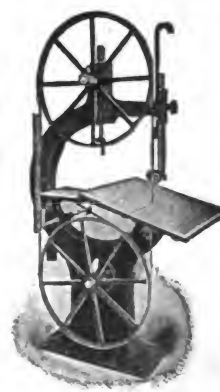


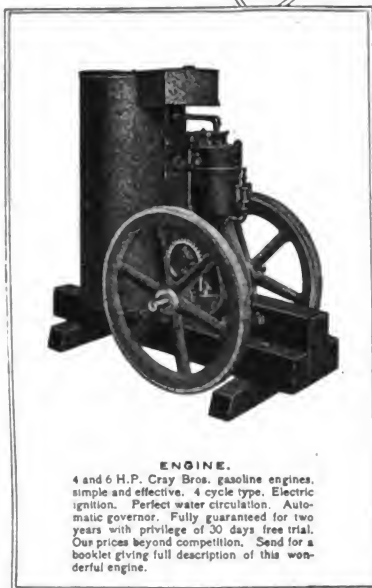
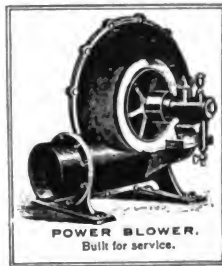
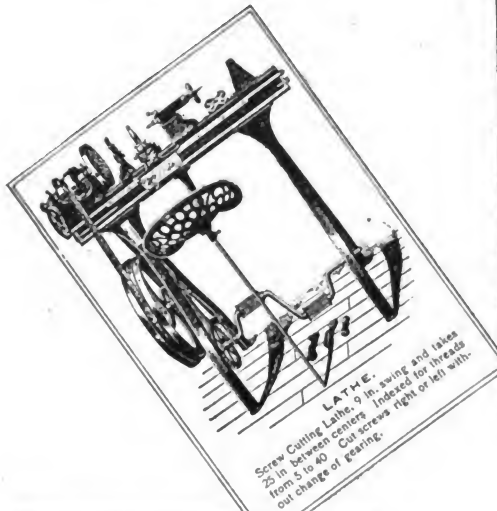
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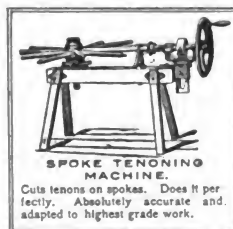
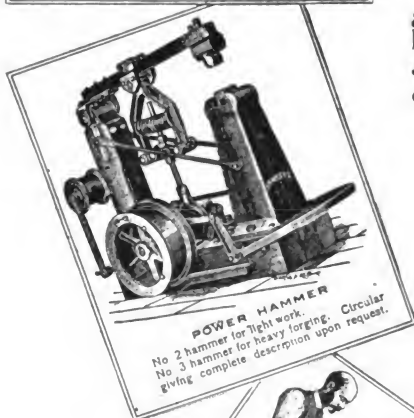
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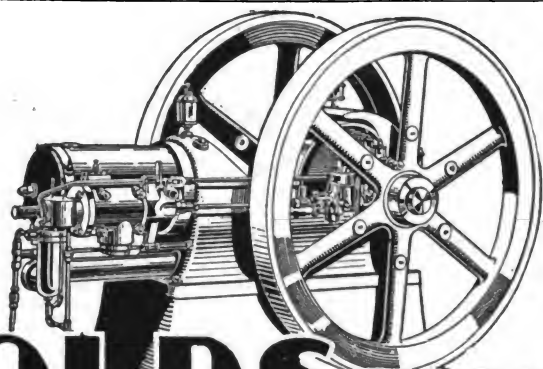
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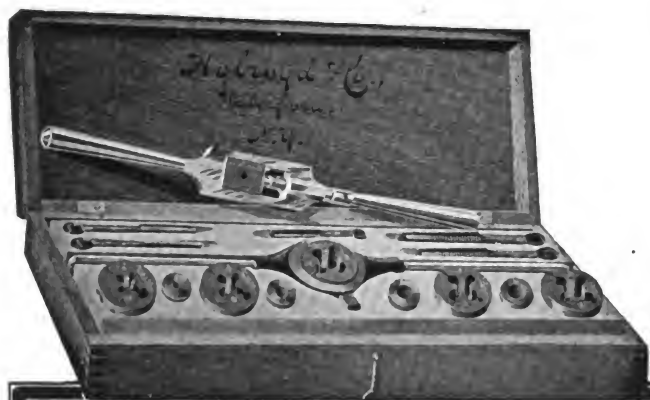
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# THE AMERICAN BLACKSMITH

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## Congress; its Latest Session.

The first session of the 59th Congress, just adjourned, will be recorded as one of the most noteworthy in the history of this country. President Roosevelt himself says: "This session of Congress has done more good work than any Congress since I have become familiar with public affairs. I would not be afraid to compare its record with any in the history of the country."

The session saw many hot fights and sharp contests, yet no influences, no matter how strong, were allowed to stand in the way of measures and laws necessary to the good of the nation. The railroad rate bill, the bill removing the tax from denatured alcohol, the Panama canal appropriations, the preservation of the beauties of Niagara Falls, the beef trust investigation, the reorganization of the consular service, the increased appropriation for the state militia, all were vitally necessary and seldom has such an array of measures been passed by any one session of the national legislative body. In this connection we might mention that this same Congress appropriated some two and a half millions of dollars to the

sufferers at San Francisco. The expenditures authorized by this session will total very near to ninety hundred millions of dollars.

## Caring for the Tools.

Of course the simplest method of caring for tools is not to care for them, i. e., to drop them where last used and leave them there until wanted. They are then hunted up, cleaned, repaired and used, and again the same program is followed. This system of tool management, if it can be so called, savors very much of the Tom Tardy brand and of course finds no advocacy in the shop of the modern craftsman.

The proper care of tools is to have a place for each of them and to have them in their places when not in use, to have them cleaned before being replaced and to keep them in condition and repair so as to make possible their immediate use at all times. A special room, should the equipment be sufficiently large, is essential to the proper care of tools. Or, should the space be limited or the equipment be of smaller magnitude, a cabinet or rack will undoubtedly be found to answer the purpose admirably. Pigeon-holes and shelves are excellent for the small tools frequently used. Drawers are recommended for fine tools that require to be kept free from dust, dirt and rust, but care must be exercised not to overload them. In the case of a number of files; it is better for the life of the files to devote a separate compartment to each. Throwing them promiscuously into a drawer will soon dull their teeth; to lengthen their life and usefulness a file rack will be found of extreme value. Boxes as storing places for tools are not usually satisfactory and the careful smith generally makes use of some other system for taking care of his tools.

## The Scrap Pile as a Shop Indicator.

The scrap pile of the average smith-shop is a most reliable shop indicator, its silent but truthful tale of shop man-

agement being impressed upon even the casual observer. Its story cannot be argued away, its truth cannot be questioned, but its indications should and must be considered by the smith, who desires to do business at a profit. Watch your scrap pile as you would your tools. Examine it carefully at regular intervals. Inspect it intelligently, and then make use of its indications for profit.

The final resting place for everything of no further use in the smithy will tell whether stock is being used economically or wastefully. It will tell whether or not that new brand of drills is worth a second order. It will tell if certain tools are doing the amount of work required of them or whether they had better be replaced by others. In short the intelligent inspector of the scrap pile can see just where the little leaks are and by heeding their cry remedy them before it is too late.

The scrap pile represents a certain part of the capital invested, but it is needless to say the investment is at the wrong end of the business. It is therefore imperative that it must be cut down to the bone. Wasted stock, careless employees, unreliable tools, these are the answers culled from the scrap pile. How many business ships have been sunk by these leaks? How many shop owners inspect their scrap piles regularly with the view of stopping the leaks? How many smiths give the heap of scrap any thought at all? Consider the scrap pile; its tale must not be ignored by the progressive craftsman.

## Our Readers as Contributors.

There are certain of our readers who contribute regularly to our columns. They seem to feel that it is part of their duty to the craft to help and assist their brother smiths as much as possible. In their letters they freely discuss the subjects and articles appearing each month. They criticize and enlighten their brothers. They show this one a better method, and illustrate for that one a home-made labor-saving device

or machine. In fact all branches of the smithing craft are thoroughly and freely discussed each month. But it is not this class of our readers that this article is intended for primarily. Those of the opposite class, those who have read the paper for years, have enjoyed the articles, and profited by the advice yet have never been represented in the paper by a letter or article on any subject. These are the readers we especially desire to address now.

Our columns are always open to readers for discussing articles on up-to-date craft subjects, and we want every reader to feel that it is his craft-duty to write an occasional letter for publication in these columns. There are surely many kinks, methods and shop happenings that would be interesting to the craft at large. Perhaps one or more shop-made tools or machines are used, probably some good side-line brings in an extra profit, or some novel

sidered in the prize contest which is now receiving the attention of our readers, mark your paper "Prize Contest." Particulars regarding this contest are given on page 45. Whether or not you desire to enter this contest write an interesting article for publication. Your brother craftsmen are just as interested in what you have to say as you are interested in what they write about in our columns.

#### The Annual Convention of the I. R. M. B. A.

The fourteenth annual convention of the International Railroad Master Blacksmith's Association will be held at the Sherman House, Chicago, Illinois, August 21, 22 and 23. It is expected that a most interesting and profitable meeting will be held. A very pleasing program has been arranged for the ladies and it is hoped that a large number of them will be present.

Flue Welding—best methods of Flue Welding and Flue used.

Classification of Work in shop.

Tools and Formers for Bulldozers, Steam Hammers and Forging Machines.

Discipline and how to obtain the best results in a Railroad Blacksmith Shop.

Case Hardening methods—Time taken and specimens of Work Furnished and Kind of Material used.

Best method of annealing High Speed Steel, also of Tempering same.

Best Coal for use in Smith Shop and kinds of Fires used.

Subjects of 1907 meeting.

Piece Work.

Making Locomotive Frames—From scrap to finish, also repairing. How many broken in the Year; how many broken in same place.

Thermit Welding and Cost.

It is our intention to publish a report of this convention in these col-

378.



THE FORGE ROOM MUST BE WELL-LIGHTED AND WELL-VENTILATED TO INSPIRE BEST EFFORTS.

system is in force,—all these subjects, with many others, are of interest to our readers and we want every reader, who has not yet been represented, to send in an interesting item within the next two months. This issue is the second last number of the volume and we want you to resolve to be represented by at least one article in each volume. If you desire your manuscript to be con-

The association also invites all motive power officials and foremen blacksmiths, whether members of the association or not.

The list of subjects to be discussed will be of intense interest to all men connected with railroad shop work as is evident from a glance over the following list:

Frogs and Crossings.

umns, together with the principal papers read and subjects discussed before the members of the association.

#### The Course in Forging at Iowa State College.

D. M. CURL.

The forge shop at Iowa State College occupies one half of a building 38 by 76 feet; the other half of the building being occupied by the foundry.

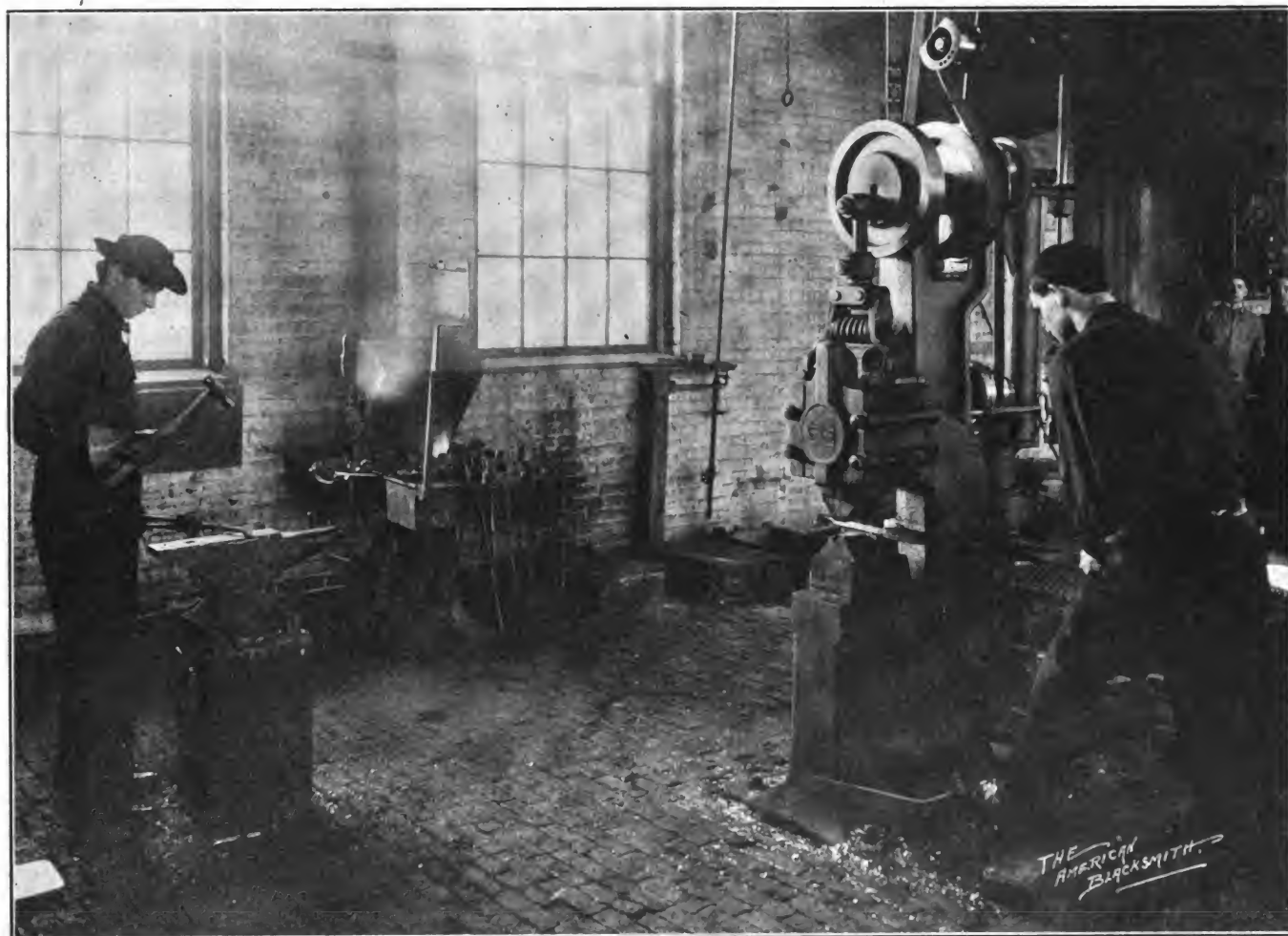
The building is of brick, the inner walls of which are covered with a white cold water paint. The slate, gable roof is supported by a heavy steel truss. The north gable has a series of skylights, and these with the eighteen extra

used for driving the line shaft. The shop is heated by an overhead heating system which uses the exhaust from the power house.

The course of instruction in the forge shop consists of a number of graded

the student in the machine shop work which comes later.

After completing a certain number of prescribed exercises, the student is allowed to undertake work for himself which is within his powers, provided he



THE STUDENT IS TAUGHT TO USE BOTH THE HAND AND POWER HAMMER.

large windows give an abundance of good light; a very essential thing in a foundry. One feature of the steel truss is worthy of special mention, and that is the heavy material of which it is made, making it strong enough to support a track for a traveling air hoist used in the foundry and forge shop for heavy work.

The equipment of the forge shop consists of thirteen forges (one Ferguson oil forge and twelve Buffalo Down Draft forges), one Dupont power-hammer, one Frank Douglass drill press, an emery grinder, swage blocks, cone mandrels, flatters, set hammers, fullers, swages, sledges, bolt heading tools, and a vise and bench. Each forge is provided with a full set of tools including cold and hot chisels and tongs of various sizes.

The power for the entire shop is furnished by an Edison motor located in one corner of the forge shop, and is

exercises, the first twelve of which are made from wrought iron and machinery steel. These exercises come in the following order: drawing down square and pointing a round bar; door hook and staples; open link; welding several scrap iron bars together (to teach the student what a welding heat is, and the use of the power hammer); twelve links of a chain and a round ring; two welds, one made from round iron and the other of square; band ring weld; washer weld; T weld; angle weld; two bolts, one with the head welded on and the other up-set; a pair of tongs; a grab hook, and a swivel. Next in the course comes steel work: forging, welding, tempering tools, such as round-nose, boring, cut-off, diamond-point, and facing lathe tools beside cold chisels, cape chisels, hammers, hardies, drills and various other small steel articles, knowledge of which will be helpful to

has a drawing or model for the same. Before permitting a student to begin an exercise the instructor explains the process by which it must be made and the results to be obtained, and requires strict adherence to directions, otherwise the student is likely to correct his mistakes by making others.

The mechanical, electrical and mining engineering students have eight hours per week in the forge shop for one semester or term. The courses in foundry, pattern-making, and machine shop follow the forge shop and complete the required shop work of the college.

#### How to Make the Tongs Work.

W. M. BAKER.

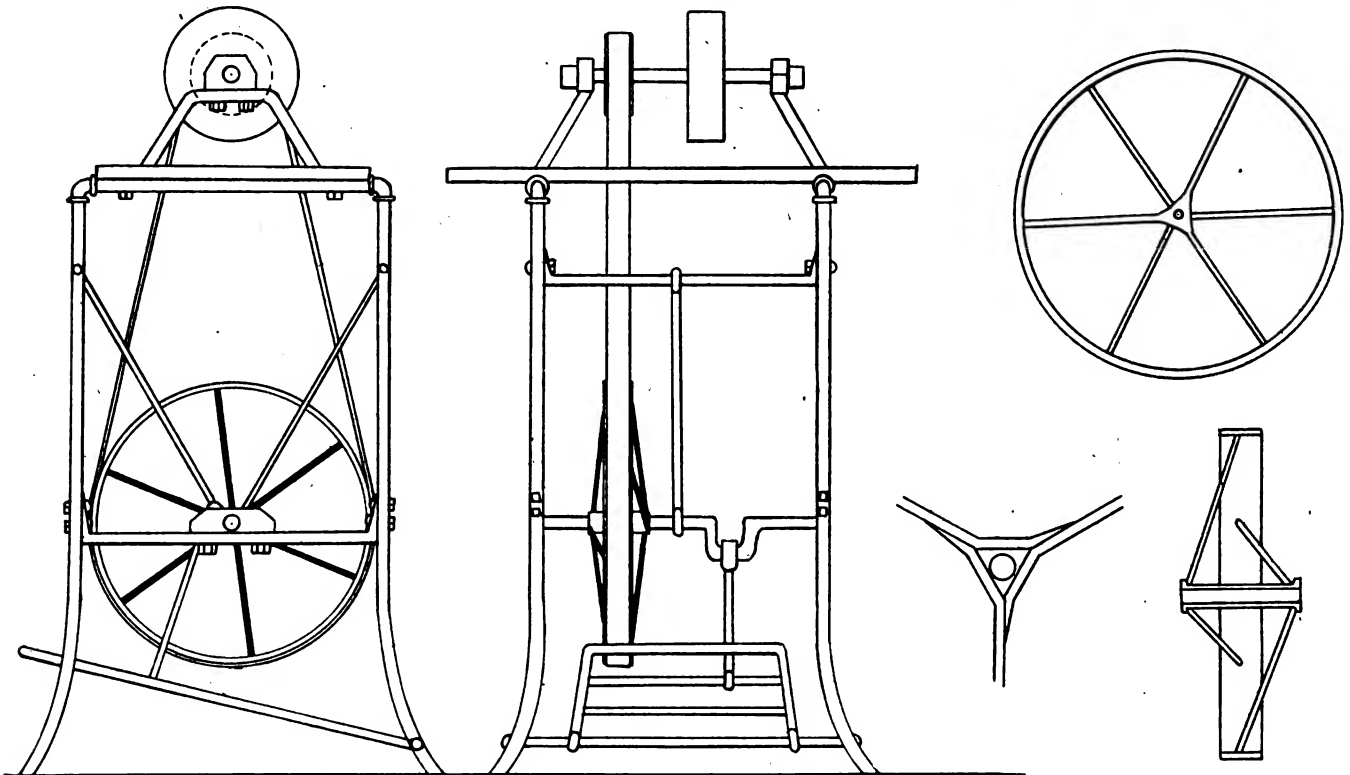
The article on the making of blacksmiths' tongs in the June issue reminds me of a little story, it may possibly aid the young smiths (and perhaps some old ones too) out of a similar difficulty.

The story is told as follows: An apprentice in a country shop being alone one day, the boss having gone to town, decided to improve the opportunity by forging a pair of tongs. Every step in the process was carefully followed and the tong jaws were nicely finished and smoothed. Finally the young man placed the jaws together and riveted them with a hot rivet as he had seen the boss do many times. But great was the amateur smith's surprise when he found the jaws could not be forced apart. He therefore placed the tongs behind an old box. That evening at supper the apprentice told his employer the following story: Once upon a time an apprentice made a pair of tongs and after riveting the two jaws together he found they could not be moved;

for the legs and top pieces, and four  $\frac{3}{4}$ -inch elbows. The pipes were threaded and screwed into the elbows and the legs were then bent as shown in the engraving. I then used half-inch pipe flattened at the ends and arranged them as leg braces, putting them together with  $\frac{1}{4}$ -inch bolts. The top of the frame is 14 inches square from center to center of elbows and is bolted on a 14 by 18-inch board for the table. The brackets which hold the shaft for the emery wheel are made of 1 by  $1\frac{1}{2}$ -in. iron and are bolted on top of the table. The shaft for the emery wheel is a piece of  $\frac{3}{8}$ -inch round stock with a 2 by  $1\frac{3}{4}$ -inch piece shrunk on and used as a pulley. A  $2\frac{1}{2}$ -inch washer is also shrunk on this shaft as a wheel flange. This is turned up in a lathe. The small

make an emery wheel stand with little or no cost. An emery wheel suitable for this stand would be about 8 inches in diameter by  $\frac{1}{2}$ -inch thick. If a suitable belt or fly-wheel can be secured from some discarded farm implement it will save the trouble of making one. This is a very handy tool, and will often save time in starting up the engine or using the old grindstone.

Although the height and size of this stand may be altered to suit various conditions I have found the following about right. Height of stand 38 inches. Dimensions at top 14 inches square; stock for legs to be  $\frac{3}{4}$ -inch gas pipe. Leg braces:  $\frac{1}{2}$ -inch gas pipe bolted with  $\frac{1}{4}$ -inch bolts. Treadle is made of  $1\frac{1}{4}$  by 2-inch stock bolted firmly together. The large wheel is 26 inches in diameter



AN EASILY CONSTRUCTED MACHINE WHICH THE SMITH WILL FIND VERY HANDY.

thinking he had made a very bad mistake he threw them away. "He couldn't have known very much," said the boss, "or he would have heated them." At the very next opportunity the young smith placed the tongs he had made in the fire, and found that they could be very easily worked.

#### A Home-made Foot-power Emery Stand.

W. D. BOETTLE.

The accompanying engraving shows a foot-power emery wheel stand which I made and am using in my shop for grinding small tools such as cold chisels and drill bits. I used  $\frac{3}{4}$ -inch gas pipe

wheel shaft runs in 2 small boxings on the top of the brackets. The large wheel, or fly-wheel, is 26 inches in diameter with a rim 2 inches wide and  $\frac{1}{2}$ -inch thick. The spokes are of  $\frac{1}{2}$ -inch rods and are arranged as shown in the engraving. They are six in number and each set of three are welded in such a manner as to leave a triangular shaped hole into which a piece  $\frac{3}{4}$ -inch pipe 5 inches long is fitted. For the crank shaft I use a  $\frac{3}{4}$ -inch rod, and after drilling a  $\frac{1}{4}$ -inch hole through the hub of the wheel and shaft fasten them together. I think this description will be sufficient so that any practical craftsman can

with a rim of 2 by  $1\frac{1}{2}$ -inch iron. Spokes are 6 in number of  $\frac{1}{2}$ -inch rods, 3 on either side of the hub boxing, which is  $\frac{3}{4}$ -inch gas pipe. Two lock nuts at each end of the hub hold the spokes securely in their proper place.

#### Dont's for the Craft.—4.

For the Apprentice.

"A. PRENTICE."

Don't talk too much.  
Don't tell "tales out of school."  
Don't argue with the "old man."  
Don't fail to be polite to customers.  
Don't ever think that you know it all.  
Don't forget the "old man's" advice.  
Don't try to learn everything in a day.



Don't do any hammering on the drill table.

Don't use a screw driver for a cold chisel.

Don't use a monkey-wrench for a sledge.

Don't gauge your work according to your pay.

Don't ask more questions than are necessary.

Don't wait to be told to empty the "slack tub."

Don't grind on the flat side of the emery wheel.

Don't use a new file on solder or babbitt metal.

Don't forget that a clean shoeing floor looks inviting.

Don't do any drilling with the drill press "just for fun."

Don't play ball or pitch horseshoes during working hours.

Don't go about "oilin' things up" unless things need "oilin'."

Don't leave a shop without leaving a clean record behind you.

Don't forget that a successful smith must also be a business man.

Don't say "I know" and "I understand" unless you really do.

Don't forget to listen attentively when receiving instructions.

Don't go about telling the latest stories to your fellow workmen.

Don't forget that there are usually many ways of doing certain jobs.

Don't forget that you're expected to do some things without being told.

Don't "fly off the handle," when you are corrected about some mistake.

Don't break a tool or machine and then try to shift the responsibility.

Don't forget that you are expected to reason out some things for yourself.

Don't throw the hand tools around as though they were pieces of scrap iron.

Don't "poke around" the engine, especially if you know nothing about it.

Don't forget that you will never be too old to learn more about the business.

Don't think that you cannot maintain a certain degree of neatness about you.

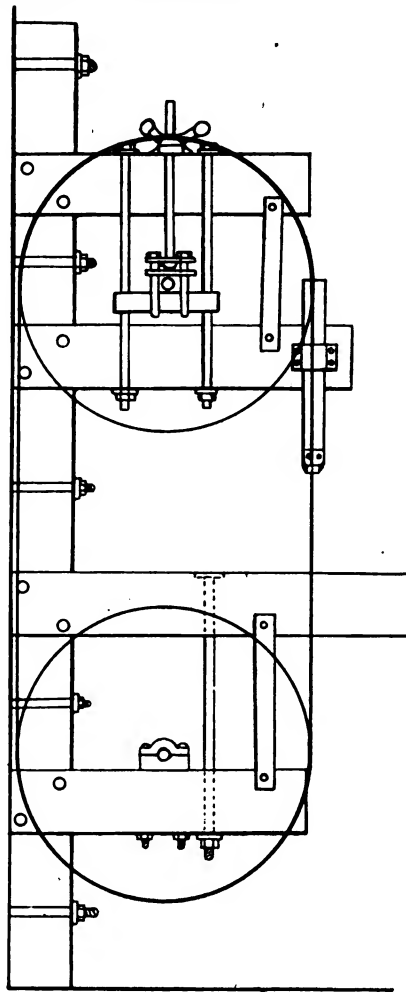
Don't think that you are a blacksmith just because you work in a smith shop.

Don't forget that carelessness is generally responsible for stripped bolt threads.

Don't forget that many things which you see and learn in the shop are business secrets.

Don't hesitate to tell the boss that you have ability along a certain line, if you have.

Don't forget that a forge-fire generally produces about as much smoke as is necessary in the smithy.



A BAND SAW IS USEFUL IN EVERY GENERAL SHOP.

Don't tell the boss that you don't think those old bolts and nuts are worth the time necessary to remove them.

Don't forget that your present job, to a certain extent, decides whether or not you are to be a successful craftsman.

Don't practice "The Anvil Chorus" during working hours—it's mighty hard on the nerves unless accompanied by a brass band.

Don't forget that you are now forging your future—see that no flaws, cracks or other defects are allowed to happen during the process.

Don't be continually whistling at your work—there are probably others in the shop who cannot appreciate your efforts to entertain.

#### A Shop-Made Band Saw.

Z. T. CARY, JR.

The band saw which I use in my shop is one that I made myself. The frame is of white oak and is made of

stock 4 inches by 6 inches. The wheels are 20 inches in diameter and were made as follows: I took some matched boards and fitted them together until I had four pieces 20 inches square. I then took each set of two and nailed them together in such a manner as to have the seams of the top boards run across and not parallel with the bottom boards. The wheels when finished should be two inches thick. I now got an old buggy hub and sawed off each end of it close to the iron band. I then fitted one of these pieces directly in the center of each of the wheels. After fitting the hub in place, I bored out the hub to fit the shaft. This can be done with the hub-boring machine. I now put the wheels in place after banding them and then I trued them up by running the engine and holding a rasp on the rim of the wheel. I now applied a band of rubber to the edges of the wheels and put the saw on.

The lower wheel is fastened on a shaft which runs in a stationary boxing on the lower cross piece of the frame. The upper wheel, however, is attached to a shaft which runs in a boxing which can be raised or lowered by a threaded rod and wheel. By this arrangement it is possible to use saws from 10 to 12 feet long on this machine. I use my saw to cut stove wood and have cut up three cords of it in less than an hour.

The accompanying engraving will give the reader an idea of how the frame is made up. The table on my machine is 28 by 30 inches, but any of these dimensions can be altered to suit the requirements in the individual shop. It will be noted that simple circles are used to represent the edges of the wheels as the boxings and slide are on the side of the machine opposite to the position of the observer.

#### A Valuable Wheel Preserver.

H. B. FREEMAN.

As a wheel preserver and hot weather tire tightener, tar used as a paint is unsurpassed. When the heat of the sun softens tar paint, it enters every pore of the wood, and as it carries with it considerable dirt and dust the resulting composition is what might be termed "near-asphalt."

To apply the paint, it should be as hot as can be without injuring the bristles of the brush and then thinly brushed and spread upon the felloe of the wheel. The best time for applying is during an extremely dry hot season, so the tar will readily penetrate the pores of the wood and form a solid

mass. One application each year for two or three years will preserve wheels with entire satisfaction. In the wet season this paint preserves the wood and prevents it from becoming soaked with water and dirt and subsequently rotting. The paint is very cheap and can be purchased in cans holding five and ten gallons each, which is sufficient for the uses of the average shop.

Properly used this paint will dispense with all tire setting and greatly lengthen the life of the wheel. As a matter of economy and durability, treating the wheel in this manner is strongly recommended.

Another method of applying the mixture is to hang the tireless wheel with its rim dipping into a pan of the tar paint. The wheel is now slowly

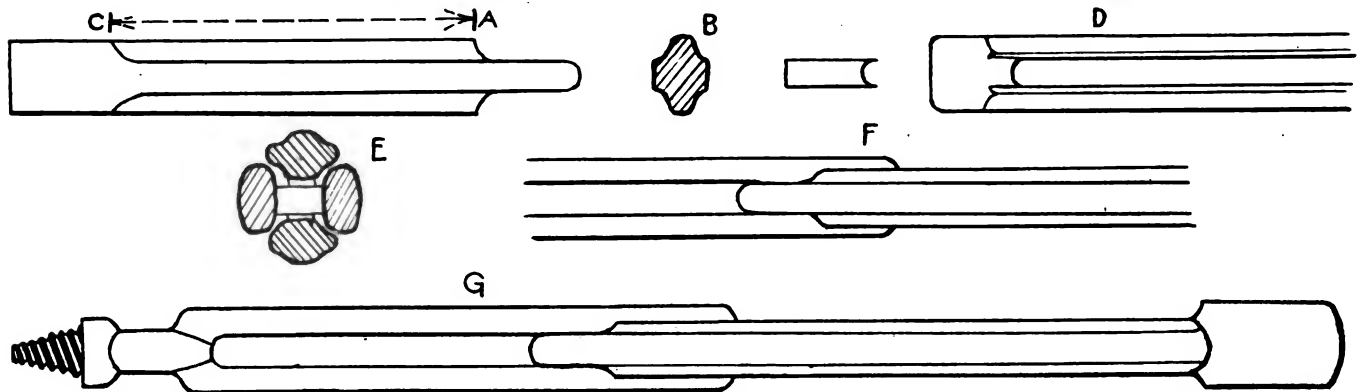
to form part of the jar tongue, as shown at A in the accompanying engraving. Then chamfer the corners of the short piece of the bar from A to C to a miter, i. e., an angle of 45 degrees, leaving  $1\frac{3}{4}$  inches flat on flat side of bar. Do this on all four corners of the bar, so that a cross section of the forged bar will be an oblong hexagon, as shown at B. The chamfered section need be 15 or 16 inches, leaving the stock full for welding to the joint or bar as the case may be.

You will make four of these pieces to form the reins of the two links of the jars, then draw out two pieces  $1\frac{3}{4}$  by  $1\frac{3}{4}$  to form the striking heads. These pieces should be 5 or 6 inches long. They are laid between the flat sides of the reins and welded as shown at D. When the heads are welded up, the

to  $4\frac{1}{2}$ -inch hole. When finished the links should work freely. If they are too close they may break before they get worn enough to run smooth. The above calculation of stock and forging will give about  $\frac{1}{8}$ -inch clearance, which is about right.

At G is shown the jars complete, with box and pin welded on as they are regularly made. But I have used them welded direct to the drill stem and rope socket, thus saving the price of a joint and doing good work. I broke a pair of jars in a hole a couple of weeks ago and made the new ones fast to the stem and rope socket to save time. At another time I may give a plan of the tool I used to recover the stem and bit when that pair of jars broke.

Smiths having to do with well-drill-



GOOD CLEAN WELDS ARE REQUIRED AND THE JOB MUST BE FREE FROM SHUTS OR OVERHEATED PORTIONS.

turned, allowing the superfluous paint to drain into the pan until the entire rim of the wheel has been covered. Any smith, who knows how to use it will get very good results from tar paint as a preservative.

### How to Make a Pair of Light Drilling Jars.

L. R. SWARTZ.

The stock required is  $8\frac{1}{2}$  feet of  $1\frac{1}{4}$  by 2 or  $2\frac{1}{4}$ -inch bar of the best iron procurable, or if you have a good fire and good welding compound, steel of the same size may be used, but it will require more care in working. Remember that for a job of this kind, good clear welds are required, and when done the metal should be free from shuts and not be overheated. I would recommend the use of Laffitte welding plates or some equally good compound in welding. Twenty-one inches from the end of the bar raise a heat, and with top and bottom fuller upon the edges of the bar draw out three inches of the stock to  $1\frac{3}{4}$ -inch square. Equally divide this square section and cut off so as to leave 2 inches or more on each side of the cut

space between the reins should be  $1\frac{1}{2}$  inches and the chamfers carried on out toward the tongues so that both sections can be slipped together as at F. A cross section taken through the reins when assembled is shown at E, as though taken at the point F. In order to get these parts together, set out the open ends of the links so that the unchamfered parts may pass each other.

In forming the pieces that form the striking heads it is well to concave the end of each piece across the narrow way to receive the other head against it and to lessen the chance of forming a shut just at that end of the piece in welding together. The ends of the jointstubs or other material to be welded to the open ends of the links should be treated in the same way, and in making welds the striking should not be hard right over the ends of the pieces welded in—this applies only to the ends on the inside of the links. Dress down the unchamfered parts on the outside of the links and if you have been careful you will have made a pair of jars that will carry 12 or 14 feet of 3 or  $3\frac{1}{4}$ -inch stem and bit and run in a  $4\frac{1}{2}$

ing tools will be interested to know how these were recovered, and it may prove of value to them some time.

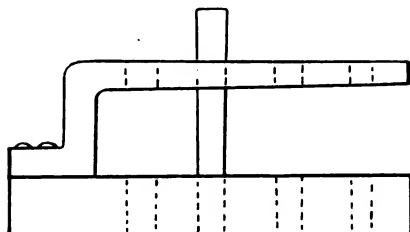
### Several Good Brazing Hints.

JAMES F. BOYD.

If you have any trouble in clamping small pieces preparatory to brazing, try the following method: Take your hacksaw and saw into both pieces of your casting so that the cuts will be exactly opposite each other, when the piece is placed together. Now take a buggy clip and pound it thin enough to fit into the slots made by the hacksaw. Now drive the two parts of the casting together and heat and braze in the usual manner. If your casting is a large one, you can make two cuts and knock out the core between, filling the space with a larger key.

To do the work using the air from the bellows or blower, take a board that will fit over the tuyere iron and bore a hole in it. Into this hole fit a gas pipe 5 inches long, and to the end of this attach a piece of common garden hose long enough to lead out-of-doors. Now place another pipe about 4 feet long in the other end of the hose, and attach

an elbow to the nozzle at the end of the pipe. Now dig a hole large enough to receive the broken casting and drive a piece of wagon tire into the ground, to form a basket underneath the break in the casting. Fill this basket with charcoal, ignite and apply the nozzle as needed. If the earth is banked around the basket you can hold the heat much better. Many smiths object to brazing in a forge fire because of the necessary cleaning. Another method of overcoming this is to take the cover



VERY HANDY FOR THE SMITH WHO WORKS ON THIN STOCK.

of an old iron heating stove (these are usually solid, and concave like a bell) drill holes in the bottom and place it over your tuyere. Now pack wet coal around it and build your fire. When your brazing is done set aside and you have no fire to clean.

### A Handy Guide for Punching Stock.

A. D. SCHEFFER.

The accompanying engraving shows a very useful tool for the smith shop. For punching holes in the edges of thin stock it is very handy. It is made as follows: A piece of  $\frac{3}{4}$ -inch stock about 6 inches long is secured and four holes of the desired size are punched as shown. Two rivet holes are now punched in the end where the top piece is to be rivetted on. Now take a piece of  $\frac{1}{4}$ -inch steel and punch similar holes in this, allowing for the bend when punching the rivet holes. The second piece is now fastened to the lower piece as shown in the engraving and the tool is ready for use with the addition of a set of punches. These must be carefully tempered so as to stand up well under the hard usage. The smith should also provide himself with several punches of different sizes, and if they are kept in good condition and their points well hardened the holes will be clean and the plate will not be damaged. A device of this kind will save lots of time at the drill press, and the smith who has a job requiring the punching of a number of small holes in thin plates will find this little tool a most valuable addition to his equipment. For boilers

and large rivetted cylinders it will be especially convenient.

### How to Read the Weight Figures on an Anvil.

W. O. BERNHARDT.

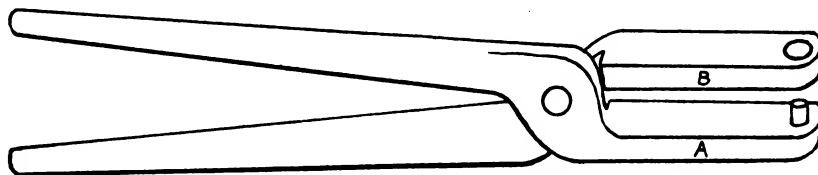
One of our Colorado friends wishes to "know how to read the figures which show the weight, on an anvil; for instance, what does 2-0-22 mean?"

The figures indicating the weight of anvil show the number of hundred weight, the quarters of a hundred-weight and the extra pounds. In this instance the first figure, or 2, shows the number of hundred weight in gross weight of 112 pounds each or 224 pounds. The second character is naught, so no quarters of a hundredweight need be considered. The quarter hundred-weight is, of course, equivalent to 28 pounds. The figure to the right is the number of extra pounds or 22 in this instance. The weight of the anvil is therefore 224 pounds plus 28 pounds, or a total of 252 pounds.

### Another Tool for Removing Broken Rivets.

GEORGE NABLO.

The accompanying engraving shows a most useful tool for the carriage repair man. It is easily made, and every practical craftsman will quickly see its advantages. The shank A is provided with a tempered steel point, a trifle smaller than the rivet in the bow. The hole in the shank marked B is large enough to let the head of the rivet pass through freely. The tool may be made of any suitable stock, and the same method as that used in forging a com-



A TIME AND TROUBLE SAVER FOR THE CARRIAGE REPAIRMAN.

mon pair of tongs is here followed. In using the tool, clamp the jaws in proper position over the broken rivet, that is, place the head of the rivet in the hole in shank B, and place the point A on its broken edge. A sharp blow on the jaw A with a light hammer will now remove the rivet easily and quickly. The value of this tool to the carriage repairman is without question, and being easily and cheaply made he can hardly afford to do work without it.

There are without doubt a great many labor saving devices, tools and machines of home-made design which

are used in the shops of brother craftsmen throughout the country, and readers of THE AMERICAN BLACKSMITH should not hesitate to send in sketches and descriptions of them for publication in "Our Paper." These articles will be as helpful to other members of the craft as their devices and hints have been to you. Be brothers in spirit as well as in calling—help each other all we possibly can.

### Blacksmithing under Ideal Conditions.

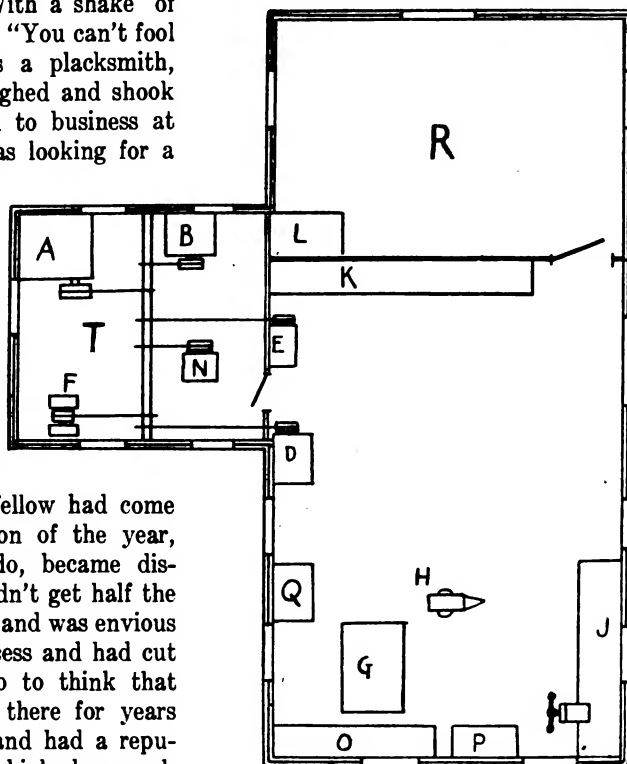
BY A VILLAGE BLACKSMITH.

After having served an apprenticeship of several years I naturally wished to go into business for myself and began to look around for a suitable location. Traveling along a dusty road one day, weary and fatigued by several days' driving, I came within sight of a village, and the first sound that reached me was the familiar ring of an anvil. About this time I met a farmer. I noticed that he had a plow in his wagon and thinking that he could give me what information I wanted, I hailed him and plied him with questions. The facts I got were about as follows. It was a thriving little village of about 500 inhabitants, two big general stores, a hardware and implement store, a livery stable, barber shop, meat shop, hotel, restaurant, two churches, and a good graded school. There were two blacksmith shops in the town, but at present one was idle. The other was occupied by a German who was over-run with work and was trying to hire help. Here at last, I thought, was the place I was looking for. Much revived in spirits I

drove on into the town and put my horse in the livery and went over to the hotel for dinner. After dinner I sauntered down the street to the shop where the smith with sleeves rolled up and hat off was pounding away. One of the merchants was standing in his door, so I proceeded to interview him. He said the blacksmith was a "Dutchman," a very fine mechanic, a highly respected citizen, and had enough work to keep him busy all the time. The other shop had been occupied by a worthless sort of a fellow who had become discouraged, sold out and gone "West." Armed

with the necessary information I went in to see the smith. I bid the smith a cheerful "Good evening," to which he gave a pleasant response in broken English. I then began a rapid inspection of my surroundings. I found the shop neat and clean, tools in order, plenty of supplies on hand and lots of work lying about to be done. I felt like laying off my coat and going to work right there. After coming back to the forge I was greeted with "Vas you looking for vork?" I protested that I wasn't a blacksmith but that I was a book agent. With a shake of his head the smith said, "You can't fool me, my poy, you vas a placksmith, alretty." We both laughed and shook hands and I got down to business at once. I told him I was looking for a location to go into business and had come to look at this place and was very favorably impressed with it. He said he thought it would be all right for me as it was a good farming community, and there was consequently plenty of work for two men. The other fellow had come there at the dull season of the year, hadn't got much to do, became discouraged because he didn't get half the trade right at the start, and was envious of the other man's success and had cut prices. He didn't stop to think that the German had been there for years building up his trade and had a reputation for honesty and high-class work that was hard to compete with. The "Dutchman" got "wrothy" while telling me how shamelessly the other had treated him, of the many tricks and subterfuges he had resorted to in order to belittle him and take away his patronage. After a couple of years of hardships for both parties, the other smith had sold out and moved away much to the relief of the worthy German. I told him I thought I would rent the other shop for a year and try it, if he thought there would be work enough for the two of us. He assured me that he thought it would be all right, so I rented the other shop for a year and the same evening I rented a nice little cottage. I moved in as soon as I could, purchased what material I needed, and went to work. The shop was a very good one 24 by 40 feet, with a good brick forge, good bellows, and a very good set of tools. The way I cleaned up wasn't slow. I dressed up all the

hammers, cleaned and oiled the screw plates, arranged my shoes and other material to look neat and attractive and then stepped over to John's shop and invited him to come over and have a look. He came over and inspected everything with a critical eye. When he had done this he turned to me with his bright honest face beaming with pleasure, and said, "I'll pet you vas a different sort from dot odder feller." "You bet your life, neighbor" says I, "No cut prices this time." The joy on his face was pleasant to see and he shook



A ONE-FIRE SHOP WITH A GOOD EQUIPMENT.

my hand warmly and said, "By golly, poy, you can get anything from me vat you vants." That was good for me for he had a large stock of material to choose from while my stock was rather limited. That evening John was sitting in his door enjoying a smoke, when I went over. After a few words spoken in a low tone (there were several standing about) he got up and we went back into the back part of the shop and John gave me a list of the prices he charged for his work. I put each item down carefully and went back to my shop prepared for all comers.

Soon the jobs began to come in, and I put forth every effort to do good work, for I knew the kind of mechanic I was working against, and I knew my only hope of success was to turn out nothing but high-class work. Every day my respect for my competitor increased.

I was little more than a boy, and he a man of mature years with an experience of many years at the forge. I never hesitated to go to him for advice on anything that puzzled me and he assisted me in a manner that left no doubt of his kindly feelings for me. Our friendship was the talk of the town. How two men working in opposition to each other could remain in such friendly spirits puzzled them. After the day's work was over we would sit out in front of one of the shops and talk over the day's work, and how we would be rushed Saturday when everybody came to town, and how material was advancing, and if we hadn't better raise the price of shoeing a little. Our patrons caught the spirit of the thing, too, and knew very well if John made a price on a piece of work it was no use to come to me to get it done a little cheaper. "One price to all," was our watchword, and we stuck to it. John would come over on Saturday evening after the week's work was over and say "Vell vat you make dis veek?" I would count up and tell him. Then he would count up and say "Vell I beat you a little dis time." Maybe the next week I would beat him, then he would say "You put me out of peesness yet, you young rascal." Then we would have a good laugh. Things continued in this way for several years. We were both making money and were happy and contented. After the first year I purchased the shop, tools and also the cottage. I kept adding to my tools and stock until I had as good a supply as John, but he never showed the least envy at my success. In fact, he seemed as well pleased as I did.

This was a good many years ago and as my health failed me, I sold out and rested one year. Then I went to another part of the country and went to work, in fact, have worked in a good many places before coming to my present location. I have worked against all kinds of smiths, under all conditions, but have never found another that was like "Old Dutch John." I would again like to work under such circumstances for it removes so many of the unpleasanties that usually exist between members of the craft. I am now located in one of the best towns in the state, have a good shop, all modern tools, including gas engine, band saw, power hammers, plow grinder, pony planer and plenty of good material, yet I long for the good old days when "Dutch John" was my competitor (?), and envy, strife and cut prices were unknown. Those were

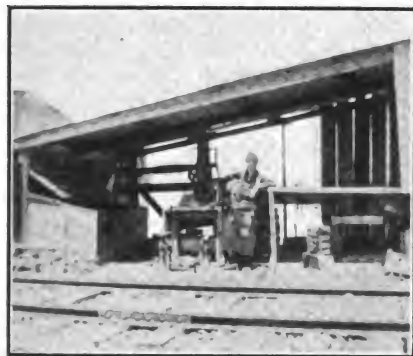


indeed ideal conditions to work under. A fight for trade on the basis of good workmanship, not cut prices, is the proper plan of battle.

### A General Shop of Louisiana.

Z. T. CARY, JR.

The accompanying engraving is a plan of my shop, the size of which is 30 feet by 20 feet. The engine room



A SMITH SHOP ALONG THE PANAMA RAILROAD.

measures 12 feet by 24 feet. I started in the blacksmith business when I was eighteen years of age, my father allowing me to work in a neighbor shop. Here I continued for about nine months and then put up a shop of my own for which I had to borrow money. This was five years ago and now I have my own home and a very good one too.

My shop equipment consists of the following tools and machines: A, is a 5-horse-power Weber gasoline engine; B, a feed grinder; D, a home-made band saw; E, a drill; F, an emery stand; G, a forge; H, anvil; J, an iron work bench with vise; K, wood work bench; L, paint case; M, work bench; N, circular rip saw; O, an iron rack; P, bolt case; Q, a tire shrinker; R, paint room; T, the engine room.

### The Panama Canal and the Smith.

The geographical situation of the Panama Canal is some what mistaken by a great many people. One would naturally think that a cut through land from the Atlantic to the Pacific ocean would run east and west. A look at the map shows that the republic of Panama, is shaped something like an S and runs east and west, and that a cut from Panama city to the city of Colon, would run nearly South to North. The distance from one side of the isthmus to the other is approximately 47 U. S. miles, and there are just 23 towns on the canal zone which are now under American control.

As far back as the year 1526 the idea

of a ship canal across the isthmus was talked of. In the year 1826 a line for such a canal was traced between Panama City and Porto-Bello, and between the years 1847 and 1874 repeated surveys were made by American, English and French engineers, with the same idea in view.

The present route was selected by the distinguished French Engineer M. de Lesseps, who constructed the Suez Canal. In 1880 he was upon the ground with his scientific corps, and work was continued till 1889, when the lack of funds compelled them to stop. By a treaty between the republic of Panama and the United States in 1903, the United States took over the work of constructing the canal. It acquired from Panama a strip of land five miles on each side of the center line of the canal, and purchased all the property of the French company for \$40,000,000.

The prevailing idea of labor to construct the canal for some years back has been that of the Jamaican negro, on account of their immunity to yellow fever. But no longer is that idea of sufficient relative value to compensate for his many other lacking qualities. The Isthmian Canal Commission in its short existence has learned more than their predecessors for centuries back, and one object of vast importance is that the Jamaican is to be imported, not for his immunity to yellow fever, but to work and nothing else.

The Commission came to the conclusion that if a canal is to be built connecting the two great oceans, it must be built by white men, as voluntary negro labor has never accomplished any great undertaking, and by paying white men a little more they can get twice the amount of work from them. Uncle Sam also has no longer to contend with the dreaded diseases of the tropics, for the Sanitary Department of the Canal Commission has made the canal zone as safe as some of our best American cities. The yellow fever is no longer a dreaded disease, and there is no longer any need of importing the Jamaican negro simply to draw pay from the United States Government, and dodge the pick and shovel. The only real good that a Jamaican does on the Isthmus is to eat. His better half will bring him something hot for this purpose every hour or so.

When the Isthmian Canal Commission sends an employee to the Isthmus it furnishes him with the very best transportation, equivalent to first class passage on any Trans-Atlantic liners.

One has a chance to see historic Cuba, Santo Domingo, Fortune Island and a glimpse of Watling's Island. On the whole the week consumed from New York to the Isthmus is one of pleasure.

No doubt readers of THE AMERICAN BLACKSMITH will be interested to know something about the part that the smith is going to play in building this great waterway. As usual the black-



THE HOME OF THE PRESIDENT OF THE REPUBLIC OF PANAMA.

smith will rank high among the great line of mechanics who are to construct the world's greatest artificial waterway. The pay at the present time of American blacksmiths is \$5.20 per day of 8 hours, with time and a half for over time. The kind of work that is required is locomotive, steam shovel, dredge and some machine forgings. Horse-shoers are not wanted as there are no horses on the Isthmus. The Isthmian Canal Commission furnishes quarters and medical attendance to its American employees free of charge. The board on the Isthmus is approximately \$25 per month.

### A Pointer on Hardening.

BY HARDY.

It is not always necessary to harden cutters, dies, reamers, taps and drills in oil. Sometimes it will be found only necessary to heat them to a good bright red and lay them in a cold blast when they will be hard enough for ordinary work. We also find it unnecessary at times to pack the work to be annealed. Simply use the tube, closing one end with an inch or two of fire clay, and place the tube in the fire with the work in it. Bring it to the required heat with a gentle blast, turning the tube to insure an even heat and to prevent burning. Care must be exercised in selecting stock for making tools of high speed steel to avoid getting a bar which may be piped or otherwise flawed as, owing to its density, it is the most difficult steel to make of a uniform quality and soundness.

**The Blood Horse.**

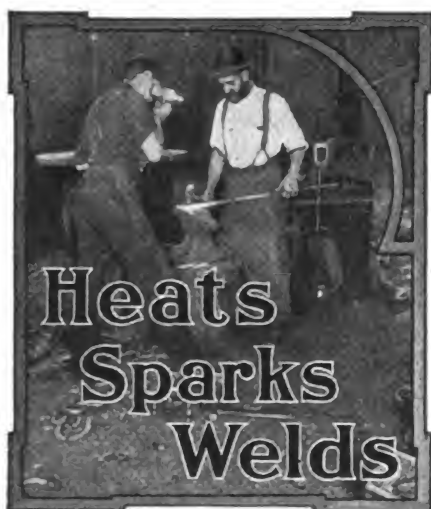
BRYAN WALLER PROCTOR.

Gamarra is a dainty steed,  
Strong, black, and of a noble breed,  
Full of fire, and full of bone,  
With all his line of fathers known;  
Fine his nose, his nostrils thin,  
But blown abroad by the pride within!  
His mane is like a river flowing,  
And his eyes like embers glowing  
In the darkness of the night,  
And his pace as swift as light.

Look how round his straining throat  
Grace and shifting beauty float;  
Sinewy strength is in his reins,  
And the red blood gallops through his veins,—

Richer, redder, never ran  
Through the boasting heart of man.  
He can trace his lineage higher  
Than the Bourbon dare aspire,—  
Douglas, Guzman, or the Guelph,  
Or O'Brien's blood itself!

He, who hath no peer, was born  
Here, upon a red March morn;  
But his famous fathers dead  
Were Arabs all and Arab-bred,  
And the last of that great line  
Trod like one of a race divine!  
And yet, he was but friend to one,  
Who fed him at the set of sun  
By some lone fountain fringed with green;  
With him, a roving Bedouin,  
He lived (none else would he obey  
Through all the hot Arabian day),  
And died untamed upon the sands  
Where Balksh amidst the desert stands.



A member of the gentler sex writes, "My husband feels lost without your paper."

'Time to get busy when the man who owes you a bill takes his work to another shop.

A bit of oil-meal in the feed occasionally will keep the horse's coat smooth and sleek.

Don't hang out a sign, never talk about your business, don't use neat stationery, if you don't think advertising pays.

A recent steamer from Seattle to Japan carried 70 American locomotives to be used on the railroads of the Island Empire.

'Tis said that the horses in San Francisco were unusually restless on the night of the

earthquake. They seemed to want to get away.

Go after them. He who waits their coming usually finds that they have been side tracked to another shop. Again we say, seek the orders.

From Belgium comes the report that the world contains over eighteen million horses. Of this number the British Isles are given credit for three million.

Those counties that are organized are enjoying good prices, plenty of work and harmony. It pays to get together. Write to the secretary for plans.

No business man is too busy to talk business. But when you talk, say something and then stop. When you listen, stop the talker when he has finished.

How's the garden these days? Ever try mixing anvil sweepings and iron filings with the soil? Try it—will brighten the flowers and strengthen the plants.

Ten years from now some people will explain the success of to-day by saying "those were better times." Don't wait ten years before making your start. Do it now.

The great Assuan dam in Egypt which was completed sometime ago, paid into the state treasury, at the end of the first year, seven million dollars more than its original cost.

Plans to harness the Colorado river by means of a 200-foot dam and an electric plant have been completed. Electric power will be transmitted to Los Angeles, California.

An opportunity for the cracker-box wise-acre—tell the smith how to make swinging a sledge as popular as swinging a base-ball bat or a cane. It will solve the apprentice problem.

The best workman will become careless when he loses the love of excellence. Don't allow yourself or your men to stray from the road of best effort which leads to the goal of perfection.

Lima, the historic capital of Peru, is to have an electric railway system operated by power obtained from falls 30 miles away. The machinery, cars and track will be made in the United States.

Don't wait until the customers bring in their machines. May be swamped with work then. Some smiths call up the farmers in the vicinity on the phone and see what they need.

"How do you manage to always have a shop full of work?" Thornton was asked. "I push for business during the busy seasons" replied our friend "and when business is slack I keep on pushing."

'Tis said that the Canadian exposition at Toronto will be opened by King Edward in September. The King will press a button in England; the gates will open and the machinery start, 5,500 miles away.

Tom says it's most too hot to do much work these hot-wave days. We recall one day last winter when he quit work because it was too cold. Tom's a good hand at bad excuses. Ever run across any like him?

A business can be run without advertising and a wagon will go without greasing, but in both cases the going is hard. Several good applications of advertising grease will keep your business wagon going smoothly.

Of the fifty directors of a recently investigated insurance company but ten were actual owners of stock. The other 40 were mere dummies and 40 men more distinguished in finance and commerce cannot be found.

"My side lines are, treasurer of a mutual fire insurance company and district clerk of this township." Take this hint from an Illinois smith if you haven't a side-line but have spare time. It's up to you. Don't let your competitor get ahead.

It's the man, himself, not his surroundings, occupation or friends, that makes him truly successful. The same sun that softens wax hardens clay. Same heat in each case, but a different material or make-up. A man's true success depends on his make-up.

Lots of smiths were too late last year. 'Tis none too early to speak now. If you can use fifty exceptionally handsome calendars (most smiths can) better speak up. The design for 1907 is better than ever before and the supply is limited. Read full details on page 51 and act—Now.

The inclination to slide along the line of least resistance is the reason more people don't slide to success. Look your obstructions full in the face and pass straight through them. The hill is always steeper when we stand at its foot. No matter what holds you from your rightful success, find it, surmount it.

The African Railway to run from the Cape to Cairo has reached a point 374 miles north of Victoria Falls and 2,016 miles from Cape Town. The 281 miles from Kolomo to Broken Hill were constructed in 346 days. On 99 days, however, no work was done, so that the rails were actually laid at the rate of over a mile a day. 5,000 natives and 350 whites were employed.

"As soon do without my engine as without your paper," says a York state general smith. Let THE AMERICAN BLACKSMITH be your helper. The dollar invested brings bigger returns relatively than most gold mines. Send in your neighbor's subscription to-day and get six month's credit on your own account. We must reach the 40,000 mark before January and count on your help. Do it now.

A German engineer has invented a balloon railroad for climbing mountains. It consists of a stationary balloon, which is fastened to a slide running along a single steel rail. The rail is fastened to the side of a steep mountain, which ordinary railroads could not climb, except through deep cuts and tunnels. The balloon is to float about 35 feet over the ground, and a heavy steel cable connects it with the rail. The conductor can, at will, make the balloon slide up and down the side of the mountain. For going up the motive power is furnished by hydrogen gas, while the descent is caused by pressure of water, which is poured into a large tank at the upper end of the road, and which serves as ballast. Suspended from the balloon is a circular car with room for ten passengers. The cable goes from the bottom of the balloon through the center of the car to a regulator of speed, which is controlled by the conductor. The inventor of this railroad claims his patent will force incline cable roads out of existence.

### The American Association of Blacksmiths and Horse-Shoers.

There is no short cut to knowledge, success, or organization. Sitting idly in the shop thinking of the good organization would do you and your brother smiths will never bring results. Action is needed. To win you must keep everlastingly at it. Talk, think, and preach ORGANIZATION.

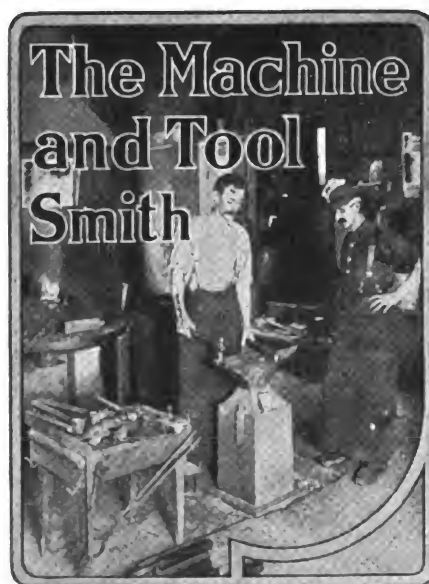
A recent letter from Eastern Nebraska reads as follows: "I agree with the article on page 171 of the June issue, and would like to see an organization extending to every part of the country. There are men in every locality who are adapted for leaders, and we want some one to take the lead and start a meeting. We smiths must do something to get better prices and better treatment. The dead beat must be cut out. The association must be formed and the smiths must be brothers in fact, not only in name." This is the proper spirit. We want determined men, in all sections of the country to take up this movement. The writer of the above letter has started the ball rolling, and we will be much mistaken if it does not result in a strong healthy county organization. Any smith with such determination cannot help but succeed in convincing his brother of the immediate need of united efforts. Mr. Reader are you going to better craft conditions in your county? Will you write and ask for information regarding the formation of branch associations? Most smiths have time at this season to listen to organization arguments. Why not grasp the opportunity and sound your neighbor on the question. Roads are generally good and meetings should be well attended. Lay the paper down for a minute and address The American Association of Blacksmiths and Horse shoers now—immediately. A postal card will do. Remember the address, P. O. Box 974, Buffalo, N. Y. Our easy plans will come by return mail. Will you do it now?

### How to Temper Cold Chisels.

W. P. WOODSIDE.

A reader asks how to temper cold chisels. I would advise him to go about it in the following manner. As the two makes of steel he mentioned are among the best on the market I am sure he will not experience any trouble in making A No. 1 tools. Heat slowly to a bright red, and with fairly heavy blows at first and lighter ones as the piece cools, forge to the desired shape. Do not strike after the piece has be-

come black or when black spots appear on it. After forging to the desired shape reheat slowly and evenly to a very low red, and lay to one side until cool. When cold reheat again, being careful to heat thoroughly and evenly to as low a heat as possible consistent with perfect hardening. As the cutting edge is considerable thinner than the other portions of the tool extreme care must be exercised or it will become too hot. This hardening heat is perhaps the most exacting part of the operation, and of course, extreme care must be taken. If the heat is too high you will find upon breaking the piece that the grain is very coarse. Heat to a temperature that will produce a fine flint like grain, and then draw the temper to the desired degree which for ordinary work is a dark purple. This should take hold quit freely on the chisel for ordinary work. You will, of course, need to be accustomed to this method before any degree of success can be attained. I have found it an excellent plan to compare the "feel" of a file on a new chisel with that on an old chisel that has stood up well. When the chisel has reached the desired temperature cool it in oil. For hardening I prefer a bath of brine or clear water not colder than 50 degrees Fahrenheit.



Burnt steel may be restored by throwing a little bromide of potash into the oil bath—about half an ounce of potash to the gallon of oil is sufficient. Cool the steel in this, returning it to the fire and reheating to a dark red and harden in water. A. R. P.

When welding steel, if the pieces have not united in the first operation the second attempt with the same steel is not likely to prove any more successful. If the steel has received edge-cracks and been burned,

the entire burnt portion will need to be removed before attempting to again weld the two pieces. F. REISER.

There is no economy in purchasing steel just because it is cheap. Steel that is cheap gives too many troubles and difficulties and the usual result is the loss of labor and the destruction of an expensive tool. The better quality may cost more in the beginning but it is generally the cheapest in the end. R. A. M.

If you are having trouble in identifying your steel when it is in the rack, why not stripe each bar of a like brand with a certain color of paint? Cards could then be placed in the rack with brand and color marks corresponding to the color of paint on the various makes of steel. A system of this kind will enable you to pick out any grade or brand of steel with certainty. Those brands of which your stock contains different grades could be marked with the regular brand color and also a color to show the grade. L. A. B.

For small tools such as reamers, counter bores, shank mills, knurls and parts for bicycles, sewing machines and typewriters, the red-hot lead bath is best for hardening. The lead, which should be a brand containing as little sulphur as possible, should be heated in a graphite crucible so placed as to maintain a uniform heat. Scrap lead is not to be used as it will ruin the steel and chemically pure lead should always be obtained for the purpose. The following compound should be used to prevent the lead from sticking to the work: One pound of powdered cyanide dissolved in one gallon of boiling water; allow to cool and then dip the articles to be heated in the solution. After removing, allow the articles to dry thoroughly before putting into the lead bath. Moisture will cause the lead to fly. Small articles are placed in the bath cold while irregular pieces are best heated to a dark red before placing in the lead. Charcoal should be sprinkled on the surface of the lead and the liquid metal should be stirred occasionally so as to equalize the heat. J. V. W.

### Hardening and Tempering Steel—10.

#### Hardening Drop Forging Dies.

F. R. MARKHAM.

Having seen a number of inquiries in THE AMERICAN BLACKSMITH as to the proper method of hardening dies used in drop hammers, I thought it might be wise to depart from our regular schedule and incorporate into this series of articles one pertaining to this important branch.

In large shops, where one man makes a specialty of this class of work, very little trouble results from the hardening of even the most intricate shaped dies, provided the operator is skilful and proper facilities are provided. If on the contrary, but few dies are hardened and the smith has little or no experience, then all sorts of trouble are liable to follow his efforts.

A man, in order to be successful when doing this class of work, must thoroughly understand the nature of steel. He must know what is liable to happen when a large piece of red hot steel is placed in contact with cold water, and especially what is liable to be the result if this piece has delicate projections, which become hard and unyielding long before the balance of the block stops contracting.

In the first place some means must be provided whereby the die may be *uniformly* heated as rapidly as is consistent with best results. The face of the die containing the impressions should not be exposed to the action of the fire as the more delicate portions might be injured. To prevent any such injury an iron box of the design shown in Fig. 1 should be provided. In the bottom of the box should be placed  $1\frac{1}{2}$  or 2 inches of charred leather. The face of the die should be placed down and in contact with the leather;

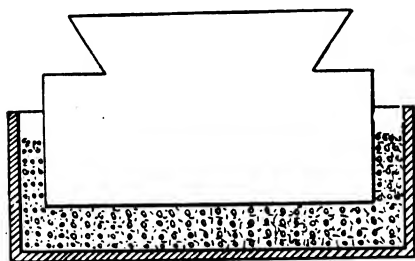


FIG. 1.—CHARRED LEATHER IS USED TO PROTECT THE FACE OF THE DIE.

the balance of the die may project above the box as shown. Some hardeners use broken charcoal instead of leather but experience has taught me that the steel is of a coarser texture, and not as strong as if leather were used. The charred leather may, by adding fresh leather to it, be used over and over for an indefinite period.

While I emphasized in a previous paragraph the desirability of a fairly rapid heat, yet it is not advisable to heat so rapidly nor to expose the steel to a heat so intense as to overheat the corners and portions projecting from the block. The die must be subjected to the heat until all parts of the block are uniformly heated to the proper temperature. The box containing the die may then be removed from the fire, and the die placed in the bath.

The bath should be so constructed that the water is projected against the die in a number of streams as shown in Fig. 2, the die resting on wires as represented. To prevent the die "humping" it is necessary to harden the tang A

first. This is accomplished by placing the die on the wires in bath with the tang *down*. If the face of the die contains intricate shapes, or light projections which would be liable to crack when hardened, these may be covered with soap or oil, while the face is uppermost and the tang cooling. When the red has disappeared from the tang, the die may be inverted in the bath and the face hardened.

To prevent annealing the tang before the face is hardened, water may be poured on it until the red has disappeared. The heat in the center of the block may then be allowed to work up through it. When hardening the tang, the overflow pipe may be so regulated that the water will come just a little above the tang. When the die is turned over to harden the face the overflow may be again regulated.

As the operation of hardening causes strains in the block of steel, it is necessary to remove the strains by a special operation, unless the temper is to be drawn immediately after hardening. This may be done by heating over a fire until a drop of water placed on the die steams. In some shops it is considered advisable to place the die in a kettle of water and heat to the boiling point, allowing it to remain at this heat for from one to two hours, to insure uniform heating.

When drawing the temper of dies it is generally considered best practice to brighten the face, place the die over a fire with the tang down and heat until the desired temper color appears, the die should then be placed in a tank of oil to check the temper. As the tang is heated considerably hotter than the face the temper would run too low unless checked. Dies that are to be used for cold dropping are generally left as hard as when taken from the bath except that they are reheated to remove hardening strains, but the temper is not drawn unless the shape is such that the temper must be drawn to insure sufficient strength.

In many shops it is customary to make all forging dies from tool steel die blocks, while in some large shops open hearth steel of the desired analysis is used. While this is not as strong as tool steel its first cost is much less and if properly treated gives excellent satisfaction. For cold dropping dies, however, especially where it is desirable to maintain a constant size or shape, tool steel blocks are the most satisfactory. Very large dies are usually made from a grade of steel that does

not require hardening. At times this is accomplished by using a high carbon steel. In other cases a steel containing nickel in varying proportions is found to give excellent results, the exact content of nickel depending on the nature of the stock to be forged. I have seen die blocks containing  $3\frac{1}{2}$  per cent. of nickel, which were used in forging high carbon open hearth steel which gave better results than when made from various other grades of steel and used soft.

A few weeks ago I saw some die blocks used for forging a difficult piece of work. These blocks were made from one of the new high speed steels. It had been used to forge 40,000 pieces and was in excellent condition, while similar dies made from tool steel die blocks would not forge more than 5,000 pieces before it was necessary to rework them.

(To be continued.)

### Another Talk on Automobile Repairing.

DAYTON O. SHAW.

The man who has been very successful in welding wagon springs may think that those of the automobile will give

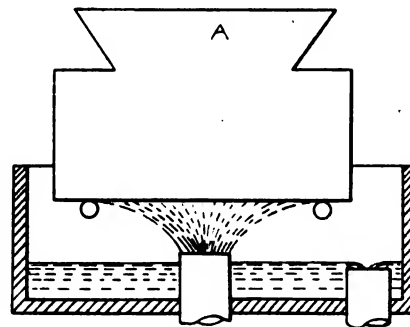


FIG. 2.—A STREAM OF WATER IS FORCED AGAINST THE DIE.

him no difficulty. He will certainly be somewhat surprised when he tries them. The high heat taken in welding makes the steel coarse and brittle, and consequently the spring is much weaker. The strain and jar on the auto differs considerably from that on a wagon. The construction also is so near the limit of the steel that there is not much "to go and come" on the metal. It must be the best that can possibly be gotten to stand the strain. The tempering may also bother some smiths especially those who have no conveniences for such work. Here is one method of tempering a long leaf spring. It is not the best, by any means, but is very much better than no tempering at all. Heat a spring in such a way that it will cool uniformly for its entire length,



i. e., heat the thin parts last, and slightly hotter than the thicker portions. Now take it from the fire, and hold in a dark place. The spring, which is now red, will grow darker until almost black, when very suddenly it will fuse up and appear to grow hotter. When it again appears to grow black, plunge it into a cold water bath for a spring temper. A little practice is necessary to get the correct heat, and the right time for quenching.

An axle spindle brought to our shop from another in the neighborhood was found to be as hard as glass. The machinist who brought it said, "Can you anneal the spindle so I can drill a  $\frac{3}{8}$ -inch hole three inches in the end, and then harden it as hard as it is now?" My reply was that I could do it. I annealed the spindle as carefully as I would tool steel, and when the job was done, the man questioned me whether it was safe to have the spindle so hard. "Is there not some danger of its breaking? Do you not think you had better draw the temper slightly?" I replied; "No, if the temper is drawn, the spindle will not be as hard as before, and the inside of it is soft." To satisfy himself the machinist ran a drill into the spindle and found the inside soft just as I had predicted.

#### A Letter-Head Design and a Shop-Made Emery Stand.

ALEX. MOORE.

In the June number of THE AMERICAN BLACKSMITH I noticed the picture of a unique letter-head design. I have a design that I think is very good. I have a nice shop and have the same



ALSO USED AS A SHOP SIGN.

design on the front of it with slightly different lettering owing to a mistake of the painter. My design is shown in the accompanying engraving.

My equipment consists of a 4-horse

power Dempster engine, a power hammer, an emery stand, a turning lathe and a scroll saw. All these machines with the exception of the gas engine, we made ourselves. In answer to P. J. E. we wish to say that my boy made as fine an emery stand as any I have ever seen. It was made as follows: He took a piece of 3 by  $\frac{1}{4}$ -inch iron, made a half twist at each end, then turned the ends up about 6 inches. He then took an old blower stand, and bolted the iron to this. He then took the cones and bearings out of an old bicycle frame and fastened the cones in each end of the casing of an old foot-pump. He then fastened an 8-inch emery wheel on one end of the casing. A piece of  $1\frac{1}{4}$ -inch pipe was then placed over the casing. This latter piece being short enough to allow for a pulley on the end of foot-pump casing. He now ran a  $\frac{3}{8}$ -inch rod through the cones, placed the bearings, and fitted another piece in place on the stand, and the result was a ball bearing emery wheel that would delight the heart of a smith the instant he saw it.

A word regarding price cutting and poor accounts. We do lots of credit work here, but I have no trouble in collecting. I have it understood, when I do any credit work, that the man owes me, and I am going to get it. About cutting prices, I never pay any attention to it. If a customer tells me he can get his work cheaper somewhere else, I tell him that is a good place to go. I always try to be courteous, accommodating and do my work well, and I am as independent as a banker.

#### An Example of Progressiveness.

Some smiths seem to think that advertising has no place in their business, that a fair use of it "won't bring any trade anyway." Mr. F. F. Thill, of a thriving town in Minnesota, is of a different opinion, however, as is shown by the accompanying reproduction of one of his advertisements which appeared in his local paper. This an-

nouncement occupied  $\frac{1}{4}$  of a regular newspaper page and shows that the firm of Donaldson and Thill is progressive and up-to-date. The arrangement of type could no doubt be improved upon, but the style and setting

## DONALDSON & THILL

We have again added to our plant, this time a machine shop, with a floor space of 1,100 square feet. Equipped with a lathe of the latest pattern, 16ft bed and a 20 inch swing, a Press Drill, Flue Welder, Emery Stand, and all necessary tools and appliances, one of the best equipped shops in the northwest.

### Threshing Machines, Steam Engines, Gas Engines, Automobiles, Lawn Mowers, Etc.,

... REPAIRED AND REBUILT ...

Mr. James Donaldson, late of the Wheaton Electric Light Co., is in charge of this department which is sufficient guarantee that all work turned out will be A No. 1.

We have also extended our blacksmith and horseshoeing shop, having a main floor space of 1200 square feet, with a store room overhead. Our Wood Shop is better prepared than ever to turn out first class work promptly. Our stock is complete. We are prepared to build or repair vehicles of all kinds.

... WATER AND GRAIN TANKS A SPECIALTY ...

Our Paint Shop is now in full blast, old rigs made as good as new. Come in and see our work.

Remember in Sam Paul we have the best horseshoer in the Northwest. EVERY DEPARTMENT IN THE HANDS OF EXPERIENCED MEN WE POSITIVELY GUARANTEE ALL WORK TURNED OUT

Come in and see us. It will be a pleasure to show you through our plant



## DONALDSON & THILL



AN ADVERTISEMENT TO BE EFFECTIVE MUST LOOK WELL

is much better than is usually found in the average country paper. Judging from the reading matter one is inclined to think that D. & T. are thoroughly alive to the times. One is impressed with the idea that this shop is the proper place to take your broken engine, your shoeless horse, and your tank and vehicle orders. This is the proper impression to create. Tell the public that you are anxious to show them some of your works, invite them to inspect your shop, tell them what you are doing. If you have just turned out an exceptionally fine wagon or buggy for Brown the grocer or Jones the doctor, advertise it. Tell the public you did it. The opportunities for advertising the smithing trade in all its branches are almost unlimited.

#### A Blacksmith Shop of South Africa.

GEORGE FORD.

The accompanying engraving is a view of my shop in the Veld country in

the Transvaal. We are located 65 miles from the nearest railroad station, and all transport is drawn here by mule or donkey wagons; oxen not being allowed to travel owing to rinderpest and other diseases. My charcoal is burned and carried in by the native girls seen in the picture. The native on the left with the horse is my shop boy, who has been in my employ for years. He is very handy, but the natives in this country are not very liable to overwork themselves. I have three shop boys, and when one goes away another comes to take his place. They are all married and have two wives, which are purchased either with money or cattle. Cattle are not plentiful, however, owing to the many diseases to which they are subjected. The two little black boys kneeling in front of me are my two cookboys. The young man on my left is the wheelwright, and the man on my right wearing the apron is my saddler. As a side line I run a saddle shop.

Behind the shop is shown a plantation of Australian blue-gum trees. These are planted for the use of the Transvaal Gold Mining Estates. This company runs eighty stamp mills. All this country hereabouts is very rough and nothing but gold mining is carried on. We have a small town and for so small a place there is a great amount of goods and material transported.

#### Wagon Lettering for the Vehicle Painter.—4

F. L. MARVIN.

The letters of the alphabet having been considered we will now take up the numerals. Those readers who have carefully followed the instructions given in previous papers will find the drafting

clusively of straight lines. These are 1, 4 and 7. But even 7 is at times made with a more or less curve in the downward stroke. The 1 is so simple that nothing need be said regarding

A B C D E F G H I J  
K L M N O P Q R S T  
U V W X Y Z 1 2 3 4  
5 6 7 8 9 0

A GOOD CLEAR LETTER, EASILY READ, BOLD AND DISTINCT.

its making. The numeral 4 is formed by making the pillar or upright first. Then the cross stroke may be made, cutting across the pillar below its center and the length of the cross stroke being exactly the same as the pillar stroke. The slanting stroke is now made joining the two. The 7 is formed by making the top cross stroke first. The down stroke is then made, ending slightly to the left of an imaginary centerline dropped from the cross stroke. The 2 is rather difficult to execute. The first stroke being an arc in connection with a compound curve. The base stroke is usually made straight when this character is used in connection with the style of letters considered in the previous articles. The 3 is a combination of two arcs of circles, the upper part of this letter being made slightly smaller than the lower part so as to give it balance and a good appearance. The 5 is executed by making the top stroke first, then the second stroke, somewhat shorter than the first, is dropped at a slight slant. The oval is now made

large oval broken on one side and a curve stroke running across slightly above the center. The 8 is made up of two ovals, the top one being slightly smaller than the lower one and the

joining stroke being no wider than the other strokes. The figure 9 is practically a figure 6 placed upside down on the line. The character 0 (naught) is so much like the upper-case O as to need no explanation. This ends the explanations of the various letters, figures and characters used by the letterer and aside from ornaments, scrolls and monograms which change and vary for different cases, the would-be letter artist should be able to make fairly good lettering.

In lettering vehicles the beginner is more liable to attempt ambitious "stunts" by way of gaudy colors and ornaments than his more skilled brother, the veteran, who is more able to successfully do this work. It was the practice several years ago to make the average business wagon, and especially those with tops, as ornate as possible. The artist usually made a most beautiful (?) scroll or two, using three or four very bright colors, and then did his lettering in some fanciful style in these. We can happily say that this style is distinctly "out" now with no immediate prospect of returning. The style usually followed by the large shops is simplicity. As an illustration the following artistic creation comes to mind. This wagon was turned out by one of our large city shops. The entire body and gear were painted a rich bright red, the striping being of gold and quite fine. The wagon had a top and this was neatly lettered in gold, the one line of lettering (the firm's name) being near the top moulding of the panel. The reader can easily imagine this combination, and as this firm has something like twenty-five wagons, all to be decorated in this manner their advertising value will certainly be great. This latter (advertising value) should be the end-in-view in every case. The lettering should be simple, easily read



A LARGE FORCE FOR A SMALL COUNTRY SHOP.

of the numbers comparatively simple. There are but three characters among the numerals which are made up ex-

supporting the figure on the line. This is made in a variety of styles to fit the style of lettering. The figure six is a

and attractive. The color scheme should be neat and clean appearing and, to a certain degree, the less number of colors the better. Another combination which has lately made its appearance is a dark green with gold striping and

on the wheel jack, screwed it down to what I wanted, and then prepared the tire. If my guess was a little off and the tire a bit too large, I fixed it up some way and the wheel left the shop. Of course, the customer would come

ter. Those who are quietly sitting on the outer edge of this circle and listening to the discussion. What have you to say about the tire setting problem?

### A General Shop of Arkansas.

FRED LUCAS.



GENERAL WORK USUALLY REQUIRES A LARGE SHOP.

lettering. A coloring which gives a wagon the appearance of lightness is a running gear of rich yellow with lines of a darker shade of the same color, panels dark green, with mouldings and striping of a medium red. The lettering on this should be of gold or a rich yellow.

(To be continued).

### That Tire Setting Question.

M. W. C. BUYP.

The old story is told over and over again, but none go far enough in their arguments. Why is it? Is it because there is no argument, or because we do not know, or because we are ashamed of the argument? Where does the fault lie? I have spent over 40 years at tire setting, and have for 30 years set tires by an old method exclusive of any other process. A well-known blacksmith known as "Uncle John Menges" told me the true secret of the business when I was a beginner. He said that tire setting is more of a guess job than anything. "But," said he, "You must first have considerable experience before you can understand what I say." I understood the old smith well, however, and now say that the traveller, divider and compass are all right when there is no trouble, but what about overdishd wheels loose in the hub, or back dishd wheels which have gone the wrong way? Which is it now, the traveller, the divider, or the compass? If it is neither of these three, it is the smith himself. I have set tires on good wheels that were back of dish, and I could do nothing else than guess at them. I sawed out what I thought would do, put the wheel

back requesting me to take a look at that good wheel, which I had ruined. Have any of your brothers had such jobs, if so how did it pan out? Let us discuss the thing through these columns.

Some smiths argue that hair breadths will carry the wheel wrong in dish. This is extremely fine work. If I run my traveller around the rim of the wheel, and then strike a line on the tire, it looks to me very much like 3 or 6 hair breadths. However, I would like to know more about these troubles. I have found

The accompanying engraving shows an interior and also an exterior view of my shop. I work from 4 to 5 hands all the year round, and get very good prices on everything I do. We make new wagons, buggies, rakes and buck-rakes, and do all kinds of blacksmithing, repairing, machine work and horseshoeing. I also retail all kinds of iron, wood and coal. My equipment consists of a ten-horse-power Weber engine, a Hawkeye trip-hammer, one big emery stand, two large drills, two grind stones, one large disc sharpener, hub boxing machine, a tennoning machine and rip and band saws. These machines are all run with the engine. I also have a Goodyear tire machine, a tire shrinker and welder, two hand blowers, one Bokep tire heater, and all kinds of other small tools that are generally used on wood and iron.

### Thornton and His Friend the Traveling Man.

We stopped in at Thornton's the other afternoon just as he was laughing a "so-long" to a well-known traveling man connected with a large eastern supply house. "Just order a new



THE INTERIOR OF A SHOP SHOULD BE WELL LIGHTED.

that if I cut the spoke tennons short on the face of the rim, or burn them down  $\frac{1}{8}$  of an inch and then put the tire on tight, the spokes will creep through the rim and in a very few days the wheel is rimbound, and the spokes are loose in the hub. But let us hear from some of the silent boys on this mat-

supply of stock," we ventured. "No," replied Thornton, "he didn't come for an order. He always comes to see me when he's in town whether he thinks I need anything or not. In fact all the drummer-chaps do. Some say it rather brightens them up to come in and chat. But don't misunderstand me, they

don't make this a lounging place. I won't stand for anything of that kind. Every one of them knows that I am very strict on that point and I don't need to tack up a sign to tell the town loungers either."

"Why are you so interested in the men who travel for the supply houses and manufacturers?" was asked. "Well" returned Thornton, "in the first place these men are important to the smith. If the smith treats them in a business-like manner they will treat him the same way. These drummer-chaps usually cover a lot of ground and I get a good many ideas from them. Now take that fellow who just went out, I knew him when he made his first route. He was rather green then but

the travellers good, solid business friends. Of course there are drummers and drummers, and some deserve to be shown to the door, but a good traveling salesman, like a good customer, is always welcome at this shop."

#### To Shoe a Horse that Forges.

J. D. I.

Forging is a defect in the gait of a horse by reason of which the animal, when travelling at a trot, strikes the front shoe or foot with the toe of the hind shoe. It is dangerous to the horse and is liable to injure the heels of the front feet, the toes of the hind feet and at times to even remove the shoes of the front feet.

The causes of the defect are several.

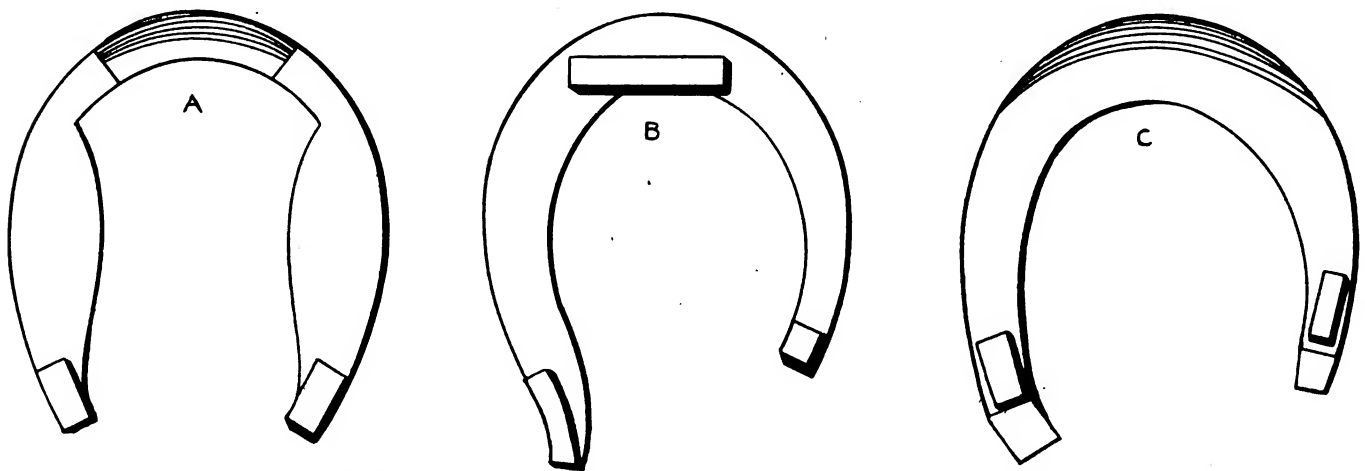
stopped. Of course different cases require different treatment. The rules and methods used in any particular instance will not hold good in all cases.

#### The Initial Meeting of the Hickory Consumers.

The purpose of the meeting at Niagara Falls on July 13th of what is to be known as the National Hickory Consumers' Association is best told in the resolution read before the meeting by Secretary Bannister. This resolution is as follows:

"Whereas, It is recognized that the supply of hickory timber is being rapidly exhausted, and

"Whereas, a complete depletion of this material would greatly disturb and probably destroy the entire vehicle in-



THERE ARE MANY STYLES OF SHOES FOR THE CORRECTION OF FORGING.

he is now generally known as one of the best men in his line. Since that first trip we have exchanged many ideas and tips and while at the start I gave most of the pointers, there is hardly a time when he calls that he doesn't give me a pointer or two about business, prices and the general condition of things. I treat all the boys right. If a new man comes around and he is willing to tell his story without all the trimmings and frizzes usually served up, I listen and soon say yes or no, and close the deal. I believe that a drummer deserves just as good treatment as I expect from the people I sell to. But that is no argument in favor of his taking up my time in useless talks. By the way some of these men talk I am inclined to think that they receive some pretty stiff treatment at the hands of some of the smiths. It's wrong and a smith, or any other business man for that matter, has no right to snap a drummer's head off when he calls. If these smiths would treat the traveling man in a business manner, they would find in

It may be caused by fatigue, faulty conformation, poor shoeing, unskilful driving and driving on heavy ground. The proper and only method of correcting this fault in the gait is by shoeing

The accompanying engravings show three styles of shoes used for shoeing animals that forge. The shoe shown in Fig. A is for the front feet. That in Fig. B is for the hind feet. Should the animal strike the heel of the front shoe, the shoe shown in Fig. C is the one to use.

These shoes were used on a special case with perfect success. The animal in question is a small mare. She was continually striking very badly and when the owner brought her in I combined shoes A and C for the front feet and used the shoe in Fig. B for the hind feet. This shoe is made with the toe calk long enough so as to come in contact with the ground before the foot goes far enough forward to strike the heel of the front shoe. After this method of shoeing the mare was found to go perfectly, and the clicking was

dusty as now operated, which would be a national calamity; and,

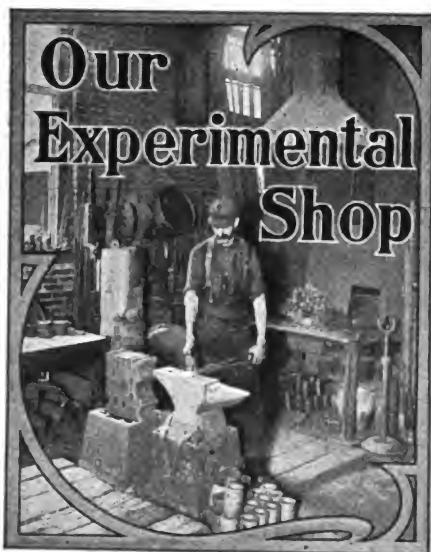
"Whereas, we, the users of approximately 250,000,000 feet of hickory per year, here assembled, recognize these conditions and the importance of taking drastic measures for the future supply, be it

"Resolved, That we form an association for the purpose of protecting and preserving the present supply of hickory timber, to encourage its future growth and to influence the Government through its Forestry Department to make a commercial study of the hickory problem."

That the meeting will result in the formation of a permanent association is fully evinced by the intense interest and enthusiasm shown by everyone present. The association will have the assistance of the Forestry Department of the Government and will be backed by the vehicle trade generally. The addresses by Uncle Sam's Forestry experts and the discussions and talks by some of the largest users of hickory



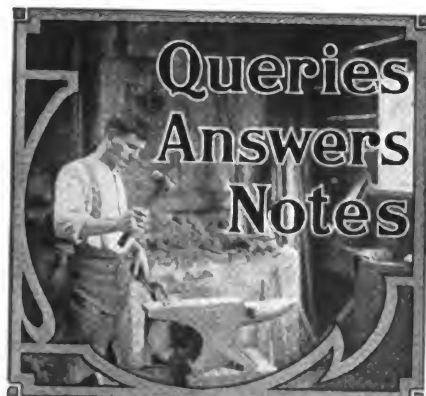
timber, threw much light on the hickory problem, and it is hoped by all that the National Hickory Consumers' Association will solve the problem of the future hickory supply.



Here will be found brief anvil jottings, hints from far and near, shop methods seen or suggested.

A veteran painter says, "Every painter has been annoyed by brushes shedding their bristles. To prevent this tendency place the brush in a vise, bristles up and after separating the bristles pour a little shellac into the center of the brush. Very little will do—just enough to saturate the base of the bristles. The brush should dry in the vise."

Vacation days have begun at the shop. Each man is given two weeks to thoroughly rest up. The boss is a stickler for this sort of thing and says: "all work and no play makes Jack a dull boy." And he insists upon a man's resting during his vacation too.



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**A Hoe With A Solid Eye.**—Will some brother smith kindly tell me how to forge a hoe with a solid eye, or what we formerly called a "Dutch Hoe?" J. HOLDBROOK.

**To Temper Hand Hammers.**—I would be very thankful if some brother smith will tell me how to temper hand hammers. Sometimes I get them too hard, and some are too soft. Can some brother smith tell me the trouble? HOLZ.

**Scarfig and Welding Channels.**—Will some brother smith kindly give me more information about scarfig and welding channels for rubber tires? I am having trouble along this line and wish to know the best methods of doing this work. MCD.

**Shoeing For Interfering.**—My method of shoeing for interfering is as follows: For the hind feet I shoe with a calk on the outside, and a "swell" heel on the inside. I have stopped it by this method when every other method of shoeing has failed. HOLZ.

**A Question on Rubber-tire Setting.**—Would some brother smith give me a few pointers on how to put on rubber tires, the tools to use and how to use them? Also the best rubber-tire setter to buy as I am about to install a plant. P. J.

**Preserving Paint Brushes.**—While talking with an old painter the other day, he told me that he kept his brushes in coal oil (kerosene) and I would like to know if this will do the trick. I keep my brushes in water and varnish. Is coal oil as good as the method I use? THEO. MELANCON.

**Regarding a Hand Drill.**—I wish some brother of the craft would give me some advice through the columns of THE AMERICAN BLACKSMITH about a blacksmith's hand drill. I work in the shop nearly all the time though I am postmaster and own a farm, but I love the blacksmith trade. Can some one help me? JAMES J. GASTON.

**Wants To Shoe A Mule.**—Can some brother kindly tell me how to shoe a mule that knuckles over very badly when walking? The heel does not come in contact with the ground at all. I have been shoeing him with a shoe having heel calks about 1½-inches high and a toe calk protruding in front about 1½-inches. Can some brother tell me a better method? A. E. THORNTON.

**Regarding a Fire Proof Shirt.**—In answer to C. D. Wallas' inquiry regarding a fire proof shirt would say, if he will soak the garment in strong alum water, and allow it to dry, he will find it sufficiently fire proof to answer his purpose. Should there be any question in his mind regarding this method he can try it with a piece of ordinary cloth. JAMES F. BOYD.

**A Few Texas Prices.**—I have a very good trade but experience considerable opposition from cheap workmen. Our prices are as follows:

Horseshoeing.....	\$1.00
Setting Wagon Tires, per set.....	2.00
Buggy Tires, per set.....	3.00
Pointing plows.....	.65 to 1.00

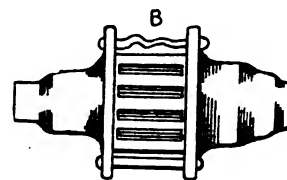
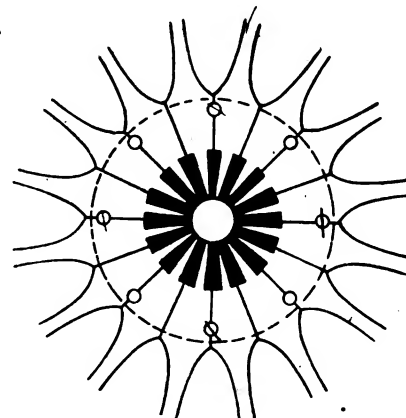
Prices for other work are in proportion to the above. The trouble with the trade is, there are too many of what I call "Jumped Up Blacksmiths." J. E. SAPP.

**Shoeing a Forger.**—In reply to G. C. Porterfield would say that my method of shoeing a forger is as follows: I pare the toes as much as they will stand, and then set the toe calk back slightly on the four shoes, not quite as high as the heels. On the hind shoes the toe is also set slightly back, and the toe calk is also made slightly lower than

the heels. The four shoes are fitted as commonly set but the hind shoes are made good and long. For light shoes or plates the following method has proven very successful. The toes of the front shoes are turned up slightly and the calks are the same as for heavy shoes. G. G. E.

**The Shoeing Of Foundered Feet.**—I have been shoeing a foundered horse for some time, and have now gotten his feet back to a normal size. When I began shoeing this animal the sole of the foot was longer than the walls, and I would pare the walls of the feet down and then trim the soles with a draw knife. This knife was curved or crooked therefore I could cut the soles about ¼ of an inch deeper than the walls, and by trimming this way I raised the soles of the foot. I kept the toes well rasped and prevented them from turning up in front. In this manner I kept them back very nicely and in good shape. The horse can now travel as well as ever. P. M. WADE.

**A Short Talk On Sarvin Wheels.**—I agree with Mr. A. J. Pantom in the June issue: whenever a man draws a rivet to make it long enough he weakens the rivet and also ruins the wheel. Notice the illustration of a Sarvin wheel, you will see by this that the spokes must fit perfectly and if the lower part of the tennon is chipped off to allow the spokes to be driven past the rivet the spoke is practically worthless. The hub at B shows the results of drawing a rivet. Take my advice and have the rivet fit the hole in the wheel snugly and then do not jump on it with a sledge, and think that you are riveting a 60 horse-power steam



THE SEARCH LIGHT THROWN ON THE SARVIN HUB.

boiler together. I can fill a Sarvin wheel and it will last as long as any made at a factory, and so can any good practical smith if he does it right. C. W. METCALF.

**Wants Power In His Shop.**—I would like to know the minimum cost of getting power to run my shops. Gas is available in this locality, and I have plenty of room. I do blacksmithing, wheelwrighting, and coach

building, with now and then a job of tool making. Electricity appears to be getting popular as a power, but I do not know anything about it. I would like the safest and best power for a general smith shop. P. D.

**Setting Boxes in Buggy Wheels.**—Will some brother of the craft kindly tell me the best method of setting boxes in buggy wheels? I have quite a number to set during the summer season. When they are not too badly cut in the hub I use thin leather to fill the space. Also kindly inform me the best method to reface and temper my hammers, after they become round faced. Some boughten hammers are too hard and chip off.

WM. P. SCHRINK.

**Galvanized Iron Roofing.**—In reply to G. N. S. would say that I have just removed some galvanized iron roofing that was on a low shop for six years. This shop had no chimney for the forge fire, and, of course, the smoke and gas went to the roof. This roofing with the exception of being tarnished, is just as good as new. I have built an addition on my shop, have raised it two stories, and am using all of the old roofing.

G. G. E.

**A Price List From South Dakota.**—The following is a partial list of the prices we receive for our work,

New shoes.....	\$ .50
Resetting .....	.25
Tires Bolted, per set.....	2.50
Tires not bolted, per set.....	2.00
New Spokes.....	.20
New Lays.....	3.00 to 4.00

Our prices are very good here. We cannot afford to work for low wages and furnish tools. I do all manner of repair work, and as a side line I sell and repair windmills and pumps. The slip shown in the accompanying engraving is one that I use when machines are brought in for repairs. G. L. GUYER.

**Anatomy of a Horse's Foot.**—In the April number on page 135, Mr. T. J. Kean expresses my ideas exactly. I have a son just going to start at the trade together with another young man who is coming to finish his trade education. The only knowledge I have of the leg and foot is from having gotten the feet and legs of a dead horse. These together with such book help as I could pick up taught me all I know about the anatomy of the foot. I do not believe the smith for whom I worked ever looked at a foot outside of his own shop. I have little or no trouble in shoeing the horses that come my way, but it is impossible for me to impart my knowledge to another.

M. F. AMES.

**Bicycle Supplies and Stifle.**—Will some brother craftsman tell me where I can buy gun and bicycle repair tools and fixtures? I have been in the smithing business in Florida for 15 years. I have also worked in northern shops. I have a small shop; an apprentice and myself doing all the work, and we rarely lose a customer. My method of running my shop is to do first-class work, and to charge all it is worth. The customer may grumble at the price, but he never fails to come back.

In a recent issue of THE AMERICAN BLACKSMITH I noticed that a brother smith asked how to shoe a stifled horse, and in reply would say that I have shod them successfully for years, by taking a small strip of iron, and after fitting it to the shoe, making it half-moon shape and welding it across the

shoe, leaving the rounding side out, and then nailing it on the well foot. The rounding piece prevents him from standing on the good leg and he is forced to use the lame one. After 4 or 6 weeks the stifle will go back and the shoe may be removed. It is necessary to throw the horse to shoe him with a stifle shoe.

E. KEEN.

**How To Shoe A Jersey Bull.**—I would like to have some brother tell me through the columns of our paper, how to shoe a Jersey bull. One of my customers has one of these animals, and it has become tender footed. I never have done any kind of ox shoeing, nor have I seen any one else do this work. Will some one therefore give me a few instructions and pointers how to go about this job?

A. E. THORNTON

**In Answer.**—If brother Thornton will be guided by the same method as that used in shoeing oxen, he will undoubtedly come out all right on this job. The ox must be placed in a stall or rack and held firmly while the shoes are being put on. Of course, the

all necessary after the shoe has been nailed.

X. Y.

**Right And Left Tong Jaws.**—Referring to Brother R. C's article on tongs in the June number would say: He tells how to make blacksmith tongs, and also how to forge the right hand jaw, and also the left hand jaw. Now I would like to ask this brother what difference there is between the two jaws for the same tongs.

I will never forget the first pair of tongs I saw made. I took particular notice that my boss made two jaws exactly the same. I offered to bet him \$1 that he could not get them together. Of course he would not bet, but asked why this was impossible. I looked wise, and informed him that he had made each jaw for the same side. All he said in reply was "Well, we will see about that." Of course they fitted perfectly, and I apologized for criticising, but he told me that was the way to learn. He said that he had little hope for the apprentice that did not ask questions.

If Brother R. C. will pardon me I will say he can make left hand tongs, but two jaws for the same pair of tongs must be made exactly the same. Brother R. C's article was very interesting, but I just want the readers of THE AMERICAN BLACKSMITH to know that I have made tongs, also that I have never drilled the rivet hole in any pair that I have forged.

L. VAN DORIN.

**The Best Of Anything.**—Mr. G. V. Blanchard is very anxious to know the name of the best gasoline engine. He says: "Some smiths say this one and others say that one is the best." It is the same old story over again. Each man thinks he has the best wife, the best children, the best cows; always seeing the good qualities of his own and the imperfections of all others. We drive our machines with a Witte 4 horsepower. It is a splendid machine. Another shop in town uses a Fairbanks-Morse. This is also a very fine engine. I know the Weber and also the Otto. They are both very good. Then there is the Foos, the Ohio, the Badger, the Bauer, the Flower City, the New Era, the International, etc. But why name them for I do not think it is possible for an impartial man to say which is the best. All that I have named and many others are very good and reliable. They require attention and the bearings must be watched and occasionally adjusted. The engine must be oiled and kept clean. The latter, I am very sorry to say though is too often neglected. We use a Wizard tubular magneto to fire our engine, and it is very good. I presume the magneto question is like the engine—lots of good ones. We have tried batteries both wet and dry and found them a nuisance. If Mr. Blanchard will get an engine of any well known make and a magneto to fire it, and then thoroughly post himself on the general principles of the gas engine he will soon have the best.

IRON ROASTER.

**A Letter From Missouri.**—I make a specialty of buggy work. I do not get 6 jobs a year on wagons, don't sharpen plows or shoe horses, but work on lawn-mowers, furniture, file saws, make keys, sharpen skates, and manufacture hand sleds, clock shelves, etc. At the end of each day I put down the amount of work done, the expense and the cash taken in. At the end of the week, I add it up, and do the same at the end

## SOLD BY G. L. GUYER

TO

M .....  
NAME OF MACHINE

Sickle—  
sections  
Guards  
G. Plates  
Sickle Caps  
Sickle Heads  
Oil Cans  
Canvas  
Chains

NEAT PRINTED MATTER MAKES FRIENDS  
FOR THE SMITH.

shoes must necessarily be made in halves. One half for each claw. This will allow the two halves on the hoof to move as freely and independently of each other as in the unshod condition. Ox shoes are usually made of iron or soft steel; are narrow at the toe; wide at the heel, and are pierced for 6 nails. In preparing the foot, care must be exercised not to rasp off much horn as it is very thin. In the above case there will be no rasping necessary as the hoof has undoubtedly been worn very thin. In the matter of fitting, the shoer may be guided by the same principles as in horse shoeing, that is, have the shoe conform to the shape of the hoof as much as possible, the edge of the shoe and hoof fitting perfectly. In driving the nails, care must be taken so as not to drive the nails into the quick. The shell is very thin, especially at the heels. Do not drive the clinches hard, and remove the chip under the clinch with a narrow chisel instead of a rasp. No rasping is at

of each month, thus I know just what I am doing. The first year my work amounted to \$1,410.69. The second year it ran up to \$1,291.63. I have no power in the shop. My equipment consists of the following: Two drills, a tire shrinker, a vise, a tire bender, a set of Green River screw plates, an Armstrong pipe die, a tire bolt wrench, and a very fine set of wood tools. In all these amount to about \$500. My only helper is my wife, and between us both we can do anything that comes to the shop. We have taken off a set of old buggy tires, bent, welded, drilled and bolted on a new set in three hours. In tire setting we have made as much as \$16.50 from sun to sun. I have put new rims on 4 buggy wheels, bent, welded, drilled, and bolted a set of wheels all in daylight. The roads here are very rocky, and if we followed the methods recommended by some, about light one-inch rims and 3-16-inch tires, our wheels would have 6 flat pieces on them before the paint got dry. Experience and location have all to do regarding the life of wheels. My work is all paid in cash and I have lost only \$3.55 since I have been here, and I get more for my work than any of the other shops in this neighborhood.

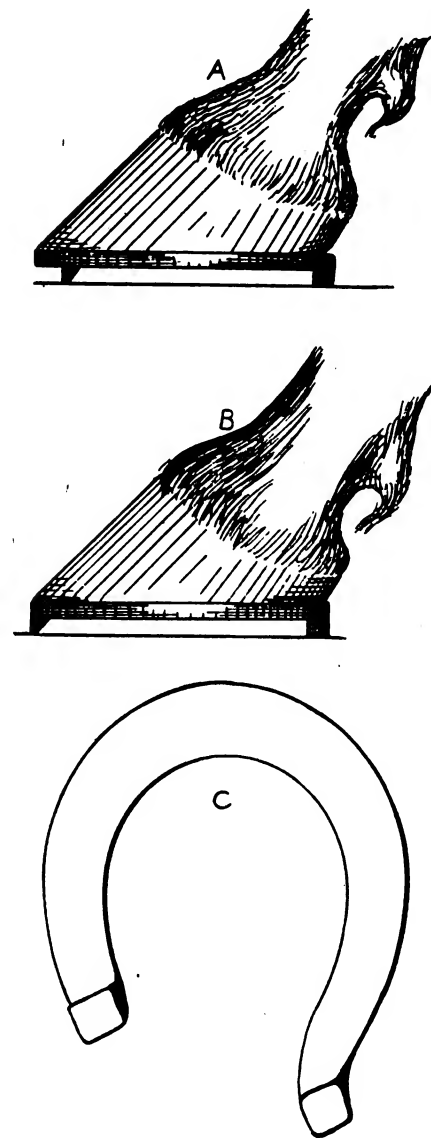
JAMES J. BOYD.

**Confederation Of Blacksmiths.**—In the June issue of THE AMERICAN BLACKSMITH, I notice that Brother B. F. Talley thinks we should have factories of our own and manufacture the goods and supplies we use in our line. I would like to give my opinion in regard to this matter. Even if we could not get as far advanced as Brother Talley suggested, we would better our position very materially by organizing a stock company among blacksmiths and wheelwrights at perhaps \$50.00 a share. Then if there were perhaps 2,000 blacksmiths organized in this manner in two or three adjoining states, they would have \$100,000 with which to run a supply house. A company like this should be able to buy just as cheap as the so called catalogue houses, who advertise their goods very cheap and must make a profit. Blacksmiths have to pay more to the jobbers than the price for which the catalogue house sells it for, especially in this state (Minnesota).

Blacksmiths cannot even buy goods as cheap as the hardware dealers can, but even if we were recognized as dealers, it would help us considerably. It is difficult to compete with the plow manufacturers in making new plow lays at the price which we have to pay for the material. The same in repairing wagons and sleighs. The material is so high that at a reasonable price to the customer our wages become very slim. On the other hand if we should charge a good price, in the case of a number of repairs on the vehicle, the customer may think it just as cheap to buy an entirely new wagon or sleigh. I trust that the blacksmiths will agitate this matter so that we can get together in a strong combination in the near future. We certainly need it. T. S.

**To Shoe A Forger.**—In answer to Mr. G. C. Porterfield's query in the June number, would say: forging is caused by paring the toes of the hind feet too short. If Mr. Porterfield will measure the front foot at the center of the toe, he will find that it is longer than the hind foot, therefore the hind foot being shorter the animal will naturally break over quicker. The result is that

the front foot does not get out of the way quick enough. To remedy this trouble pare the front toe as short as possible, and weld the toe calk back on the web of the shoe as shown at A in the engraving. The hind foot is shod as at B. The toe calk of the hind shoe should be set on the extreme edge of the toe, and should be a little longer than



THE FORGING HORSE PUZZLES MANY.

the heel calks. This will increase the action in front, and decrease it behind. Should the animal strike the left front foot with the right hind foot, make a shoe as shown at C. The outside heel calk being slightly longer and the shoe being wide on this side will make him travel wider and also shorten his step.

C. W. METCALF.

**More about the price cutter.**—Brother H. E. Kirneck in the May number seems very much discouraged about the attempt to organize, but that need not trouble him. Organization is all right, but it will not make good workmen. It takes years of careful study and practice to excel in our craft and the good blacksmith can always get plenty of work to do at good wages. I do not mean the blacksmith that can do work just good enough to pass, but the man who has brought the trade down to a science and is

master of it, takes pleasure in it and tries to excel. He does not become a slave to it, and only uses it to keep himself and family from starvation. The good blacksmith can calculate his stock and knows just how much iron it will take to make a forging of any given size. He knows how to start about it, makes no unnecessary heats and wastes no blows. A man like that never has to work at starvation prices. A poor smith may get a good trade for a while, but the customers worth having usually go where they can get the best work, even should it cost a little more.

Another thing that will draw trade is to be in the shop always. A man will go several miles to a shop if he knows that he will find the blacksmith in, although the smith may be busy. No customer likes to go to a shop and find it empty, the smith probably fishing or sitting around the village grocery telling tales.

Mr. Kirneck complains of those Tom Tardys' as he calls them cutting prices and he wants to find a remedy for it. The best remedy that I know is to be a thorough master of your trade and turn out the very best work that you can do, set a reasonable price, and let your work do your advertising. People will then soon find out where they can get the best work done, and those who want cheap jobs done let them go to Tom Tardy or Dick Miskeshift and learn by experience that cheap work is more expensive in the end. Stick to your trade and do not take up too many side lines to monopolize your time and interest. Blacksmithing is the foundation of all trades, therefore let us give it our best thought and bend our energies to excel, and we will find plenty of room at the top.

A. J. PANTON.

**Proper shoeing and Fitting.**—In the June number Mr. M. E. Wing in his article on "Correct and Incorrect Method of Shoeing" gives a theory of which I do not quite approve. He says "Nine-tenths of the blacksmiths allow the shoe to rest on the sole." Now let us see, a horse in the natural state, I mean without shoes does not travel on the wall or rim alone but uses the whole plantar surface. I have shod hundreds of horses which never before had a shoe applied to their foot, and I have observed this fact in every case: In putting a shoe on and allowing it to rest from the wall of the foot only we put too much strain on the wall and inflammation is thus caused. Besides scooping out the sole of the foot we create a hollow between the foot and the sole thus creating a place for the lodgment of gravel and dirt. Furthermore by cutting out the sole we expose the new and tender portions to all the evils of the road. We also lift the sole from the ground. By lifting the old sole on the foot we give the foot an extra brace, and place it where it tells the most, at the same time, we must remember that the old sole resembles a sponge somewhat and in taking moisture from the ground will communicate it to the rest of the foot. In summer when the roads are dry and hot the old sole protects the new sole from drying out. A scooped out hoof will dry up, lose its pliability and become more concave. A hoof in this condition has an excellent chance for contracting the toes. A shoe which is twice as wide or a little more as the wall of the foot and bearing over its entire surface will carry the horse better

and will not form a pocket for gravel and dirt. Corns have been prevented and cured by shoeing with a flat shoe. The heels are thin from the last nail hole. As the shoe strikes the ground at the corn only after the foot is placed, the pressure will not be as great as if the heels were thick and heavy. Corns, as a rule, are not the result of any fault of the blacksmith, but more often the fault of the owner. The latter will generally leave the shoes on the animal until they fairly drop off. This, of course, allows the hoof to grow and the shoe is therefore imbedded in the foot.

Right here I want to say to Mr. Blanchard that hot fitting is the better if properly done, that is, the shoe should be only hot enough to brown the surface of the foot. The shoe should by no means burn the hoof. If the shoe heated to the proper temperature, is held on the bottom of the foot long enough to mark it and not long enough to dry the foot it will enable the shoe to get a better bearing surface all around than would be the case in cold fitting. On the other hand, if the fitter is slow and has to apply the

that either side may be made lighter or heavier as the case may be.

Regarding the care of stifle would suggest linaments in place of shoes. As for the animal stifle "being out," this is wrong. The trouble is a bad strain of the cords.

Brother Baley desires to know how heavy tires are welded. As a rule they are end or butt welded using an upsetter for that purpose. I used this method 40 years ago and found it to be a success, and now weld all heavy tires in this way. G. F. WHEERRY.

**A Talk On High Speed Steel.**—Speaking of steel I would call attention to a most important thing: viz the instructions given us by the makers of tool steel themselves. Many of us may have wide experience in the manipulation of high carbon steel, nevertheless, the instructions sent out by the makers have been obtained by the most trying and severe tests, and it is only when we ignore these instructions that we have serious trouble.

The first requisite for a good forging is a clean fire and plenty of fuel. Next, the

that every variation of heat which is great enough to be noticed will result in a variation of grain, and the tool is ruined as a result of inattention to this point. The effect of high heat is to open the grain, and the steel becomes coarse. The effect of irregular heat is irregular grains, strains and cracks. As soon as a tool is heated, it should be thoroughly quenched in plenty of cool water, brine, or oil such as the case may be. An abundance of cool bath to do the work quickly and uniformly is very necessary to good and safe work. To heat a large tap, reamer, die or cutter, a running stream should be used.

When heating for tempering the first important requirement is again uniformity and the next, time. The more slowly a tool is brought down to its temper the better and safer is the operation. When expensive tools are to be made it is a wise precaution to try small pieces of steel at different temperatures so as to find at how low a heat the required hardness can be obtained. The steel should be of sufficient carbon and uniformity of quality to insure hardness at the lowest possible heat. The test costs nothing, takes but little time and often proves a saving of considerable time and expense.

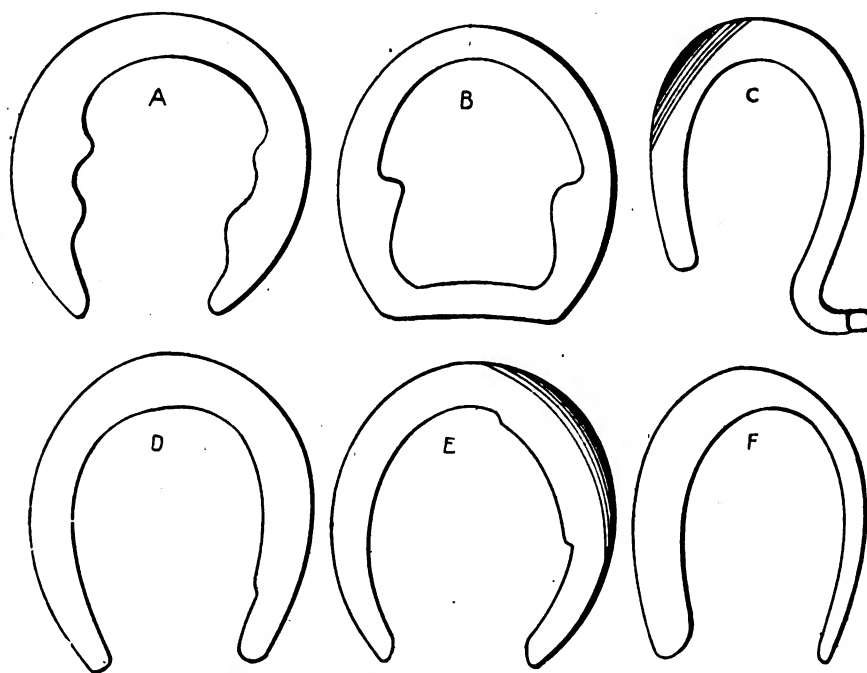
In all shops conditions have so changed during the last few years until we find carbon steel used only in fine finished tools, for it has long since been replaced by high speed steel. Had the manufacturer maintained the quality of carbon steel at medium price, where uniformity could have been secured, many places where various varieties of high speed steel have been tried and held up, showing increased output over carbon steel, could not have been demonstrated, if the best grade of carbon steel had been used.

During the last year we have been using high carbon steel for bolts and screws. The result has been most satisfactory and has stopped the use of high speed steel for this purpose. During some tests made from the same grade of carbon steel as to boiler taps and drills an equal good showing has been made. And I believe there are many places where the high speed steel has replaced the carbon steel. But if a better grade of carbon steel had been used the result would have been equally as good and a showing made as to labor, material and an increased output.

The high speed steel has come to stay for the purpose intended, lathe and planer tools, boring mill cutters, etc., and by its use some of our shops have shown increased output and remarkable reduction of cost and labor upon all classes of lathe and planer work.

There are many varieties upon the market. Some will hold the cutting edge but do not have the tenacity to resist the strains and breaks away from the cutting edge, causing much expense and loss of time. The steel which under high speed produces the best results is that which we do not bring up to that high fusion heat, but to that point where fusion begins. Therefore carry out the instructions given by the manufacturer and that which comes by experience. A good tool worker can soon learn the kind of steel he is working by the effect of the sledge or steam hammer upon the steel.

R. A. MOULD.



THE KNEE HITTER REQUIRES MANY SHAPES AND STYLES.

shoes to the foot a half a dozen times, it would be better for him to fit the shoes cold as he would simply dry the foot out and cause any number of complications. F.W.

**Shoes For The Knee Hitter.**—For the benefit of brothers who desire information on shoeing a knee hitter, I submit the accompanying engravings on styles generally used for knee hitters. A and B are practically for the same purpose, and are generally used on the hind feet of forgers. The shoe marked A may be used either on the hind or fore foot to deaden the stride of the legs. The shoe marked C is rolled at the inside toe and has an L shaped shank at the outside of heel. The one shown at F is made wide and heavier on the inside and rather narrow and light on the outside. The shoe at E has a rolled inside toe and the inside branch should be lengthened for extreme cases. Of course it is understood that these shoes must be regulated to suit conditions and

fire should be regular, giving a uniform heat to the entire part to be forged. It should be hot enough to heat the billet as rapidly as possible and allow a thorough heating. We should avoid high heating so that steel cannot be returned to its refined condition unless we have a heavy steam hammer at our command and sufficient stock in our billet, since heavy forging refines the bars so they slowly cool. After the steel is properly heated it should be forged into shape as rapidly as possible, and just as the red is leaving the parts intended for cutting edges they should be refined by rapid light blows.

When heating for hardening great care should be used, first; to protect the cutting edges and working parts from heating more rapidly than the body of the tool, and second; the entire piece to be hardened must be uniformly heated. A regular heat as low as will give the required hardness is the best to insure success. Bear in mind





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Made in all regular sizes, and in the new 18 inch Slim,  
which gives the user the advantage of a long stroke,  
— and at the same time a rasp of medium weight. —

## ASK YOUR DEALER FOR THEM



**Prices Current — Blacksmith Supplies.**

The following quotations are from dealers' stock, Buffalo, N. Y., Aug. 1, 1906, and are subject to change. No variations have taken place since last month's quotations.

All prices, except on the bolts, are per hundred pounds. On bars and flats prices are in bundle lots.

**Bars—Common Iron and Soft Steel.**

1/2 in. round or square; Iron, \$2.80; Steel, \$2.80
3/4 in. " " " 2.40 " 2.40
1 in. " " " 2.20 " 2.20

**Flats—Bar and Band.**

1/2 x 1 in. Iron \$2.40; Steel \$2.40
3/4 x 1 1/2 in. " 2.90 " 2.90
1 x 1 1/2 in. " 2.50 " 2.50

**Norway and Swedish Iron.**

1/2 in. round or square \$4.90
3/4 in. " " 4.50
1 in. " " 4.90
1 x 1 in. " 4.90
1 x 1 1/2 in. " 4.20

**Horseshoe Iron.**

For No. 1 shoe, 3/4 x 1 1/2 in. \$2.50
For No. 2 shoe, 1/2 x 3/4 in. 2.50
For No. 3 shoe, 1/2 x 1 in. 2.50
For No. 4 shoe, 1/2 x 1 1/2 in. 2.50



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**AUTOMATIC YOKE CENTRES**

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**WANTED**—A good, first-class carriage trimmer, also a wheelwright. Must be sober and industrious men. Good wages, fine climate. Business established 14 years. Excellent chance for married men. Address **JUAN MOHR,** Guatemala, Central America.

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**MODEL GAS ENGINE WORKS, B-21,**  
Produce Exchange, New York, U. S. A.

**FOR SALE**—An established coach factory in good location. Buildings in good repair. These shops enjoy a very liberal patronage of the surrounding community, being the oldest stand in the city; under the management of the undersigned for the last 49 years. Owner wants to retire on account of age. Address **W. C. FAUBER,** Lebanon, Pa.

**FOR SALE**—Modern equipped blacksmith shop in village surrounded by fine farming country. Good prices, no competition. Shipping point for grain and stock. Plenty of work the year round. Machinery, tools and material. \$500. Building \$300. Must sell soon. Reason, called into other business. Here is a bargain for some one. Write for particulars. **J. M. DUSTIN,** Marietta, Kansas.

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**KEWANEE TIRE SETTING MACHINE COMPANY,**  
416 and 418 5th Ave., Kewanee, Ill.

**WESTFAHL (MILWAUKEE) RASPS**

Can't be excelled for durability. "Hand Punched."



Our new 18 inch rasp. Round ends.  
Ask your dealer for the Westfahl brand. If he can't supply you write us your requirements  
Mention The American Blacksmith,  
**WESTFAHL & CO., Milwaukee, Wis.**

**NO. 6 1/2 CONCORD EXPRESS AXLES**

For High Grade Delivery Wagons and Trucks.  
Sold by Leading Heavy Hardware Jobbers.

**CLEVELAND AXLE MANUFACTUR'G CO.**

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Herbert Jenner, patent attorney and mechanical expert, 608 F. St., Washington, D. C., established 1883; I make an examination free of charge and report if a patent can be had; also the exact cost. Send for circular.

**PATENTS**

Send sketch or model for free examination and report as to patentability. Patents promptly secured. Advice free; terms low; highest references, and best service. Address,

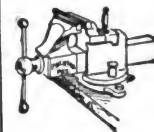
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**\$60**



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**GASOLINE ENGINES**  
for Pumping, Cream Separator, Churn, Washing Machine, Ice Cream Freezer, etc. Send for catalogue. **GILSON MFG. CO.** Port Washington, Wis.



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ALL STYLES AND SIZES  
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STEEL STAMPS  
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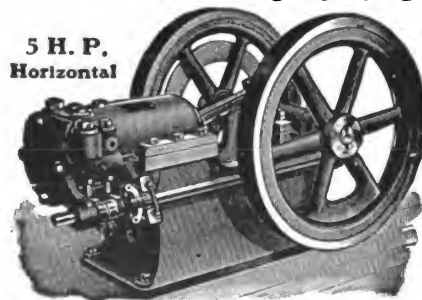


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**LITTLE GIANT GAS & GASOLINE ENGINES**

**5 H. P.**  
Horizontal



Sizes, 1 1/2, 3, 4 1/2 H. P. Vertical,  
6 to 25 H. P. Horizontal.

Either tube igniter or  
electric igniter. Shipped  
mounted on skids, if de-  
sired for farm use.

Also equipped with pumping attachments. Write for booklet describing full line New Era Gas Engines from 8 to 100 H. P. Special inducements to dealers as agents.

**THE NEW ERA GAS ENGINE CO.**

No. 63 Dale Ave., DAYTON, OHIO.



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THE NEW ERA IRON WORKS CO.

# CONTRACTED

## FEET

Every blacksmith knows how troublesome contracted feet are; how they get *blamed* for this fault when the cause is really the owner's.

Here is a way to overcome both the trouble and the blame, and at the same time *make* a good many *extra dollars* in a year besides adding a good many new customers to your shop.

Get acquainted with *O. K. HOOF REMEDY*—the quickest, surest hoof remedy you ever saw. Send to us for a trial can and test it for your own satisfaction. It is not only fine for Contracted Feet, but Corns, Dry, Cracked and Brittle Hoofs, Quarter Cracks, Thrush, and for nail pricks it is especially good. If applied promptly it will absolutely prevent lock-jaw.

If it does this, *and it does*, wouldn't you like to handle it and get the liberal *profit* we allow our blacksmith agents?

Wouldn't you like to pick up these *extra dollars* that can be earned so easy, besides it will bring you new trade who will hear of the good work *O. K. HOOF REMEDY* does?

Walter L. Long, horse-shoer, Blue Island, Ill., says,—  
"It certainly does all you say it will. Grows hoofs quicker and keeps them in better condition than any other remedy."

It has grown entire new hoofs in nine months' time. Remember it is a remedy so good you can sell it on a money-back guarantee if it fails. We want you to handle it in your town. Write for terms. THE O. K. STOCK FOOD CO., 650 MONROE BUILDING, CHICAGO, ILLINOIS.

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Instead of being able to use the dies (four to a set for each diameter) for our tools for just the diameter marked on them, one



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"DUPLEX" DIE STOCKS.

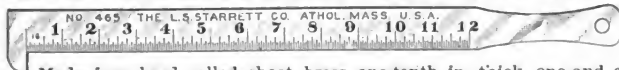
two or three besides, because of their wide adjustability, thus covering several over sizes and a little under size.

Manufactured by

## THE HART MFG. CO.

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## RULE

Made from hard rolled sheet brass one-tenth in. thick, one and one-sixteenth in. wide, with heavy graduations and figures, graduated from the end in sixteenths of an inch on one side and from the inside of the hook in sixteenths of an inch on the other, adapting them for taking correct measurements from either the outside edge of a hot piece of iron, or from the inside when held against a corner. Graduated twelve inches, have flat handles and measure over all  $1\frac{1}{4}$  inches.

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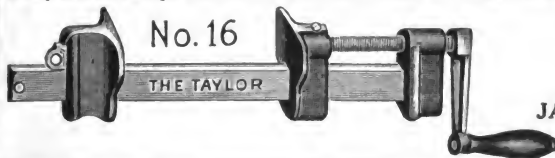
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Quick-Acting, Self-Locking.

Every size and shape used in the wood and metal working trades.

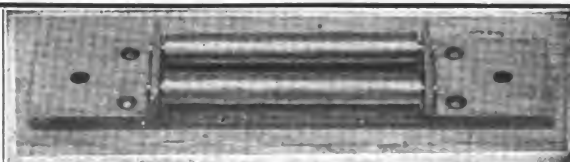


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Fill a long felt want, as they prevent the hounds from wearing into the reach. Can't wear out.

\$2.00 for 10. W. T. Daum & Bro., 146 W. Lake St. Chicago.



DOUBLE ACTION JOINTED POLE CUT HARROW  
CLARK'S NO MORE USE FOR PLOW  
SEND FOR CIRCULARS TO THE  
GUTAWAY HARROW CO.  
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Blacksmiths make big money selling Dent's Veterinary remedies. Write us of a case of ring-bone, splint, curb, spavin, blennish or other ailment your local veterinary can't cure and we'll send a remedy on condition of no pay unless the horse is cured. To convince you that Dent's Remedies cure we will send

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If you'll send 6c for postage. It's unequalled for saddle and harness galls, thrush, sore back and shoulders, chafing, wire cuts and similar injuries. Here's a chance to test our remedies and handle a line of money-makers. Write quick for terms. Correspondence solicited.  
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PAT'D APRIL 29th, 1902.

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If he cannot supply you, write us and get our liberal 30 day Free Trial Offer.

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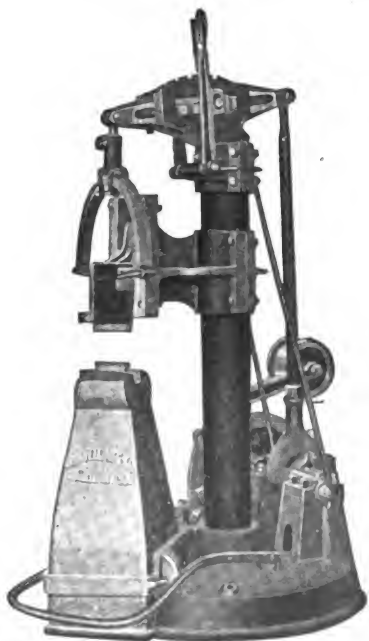
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The **ONLY** hammer on which you can get a **LIGHT BLOW** at **FULL SPEED**.

The shifting lever controls the length of stroke.

Set it in any one of the five notches and then handle the hammer with the treadle the same as any other.

Actually five hammers in one.

Write any jobber or the

**THE GRINNELL MFG. CO.,**  
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A low wagon at a low price. Handy for the farmer. Will carry a load anywhere a horse can travel.

### Low Down Wagons

soon earn their cost on any farm.

### Steel Wheels

for farm wagons. Straight or staggered spokes. Any size wanted, any width of tire. Hubs to fit any axle. For catalogue and prices, write to Empire Mfg. Co., Box 300, Quincy, Ill.

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There is no reason or excuse for any Blacksmith or iron worker to think he has reached the limit of his ability—that he cannot earn more money. Legitimate salaries to specially trained men run into large figures, and there will never be a time when you cannot earn more *if you make yourself worth more*. Every man versed in the affairs of the day knows that there is an *enormous demand for specially trained men*. It merely remains with you to secure this special training to command a responsible position and a large salary.

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Please send, free, your booklet, "1001 Stories of Success," and without further obligation on my part explain how I can qualify for a larger salary in the position before which is marked X.

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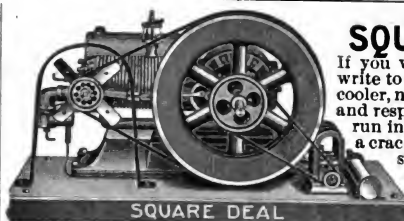


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Of batteries and obtain fat, hot sparks for your gas engine with an **APPLE AUTOMATIC SPARKER**. No belts, no switches, no batteries, for starting or running. Gives an ideal current for ignition purposes.

Write for information today.  
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## SQUARE DEAL GASOLINE ENGINE.

If you want a fair and square proposition on a good little engine, write to us. Square Deal Gasoline Engines are air cooled, no water cooler, no freezing up and bursting, no batteries to be renewed, quick and responsive. Take little room. Close crank pattern. All bearings run in oil. Our 1½ h.p. only occupies 24x30 inches floor space. It is a crack worker, a guaranteed bargain. Electric current for the spark supplied by a Magnetic Dynamo furnished with the engine.

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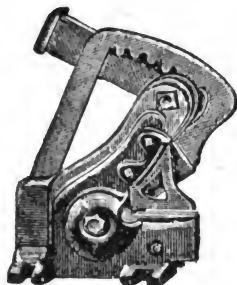
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Are unlike anything else and will do work that is impossible with any other material. **FREE SAMPLE SENT ON REQUEST** together with our new booklet, "Do You Make Your Blacksmith Shop Pay."

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Simple,  
Handy,  
Strong and  
Quick to  
Operate

**OUR CUSTOMERS SAY** it is the best shear ever put in a shop.

Pays for itself in one year.

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For sale by your jobber.

Write for Catalogue of new tools.

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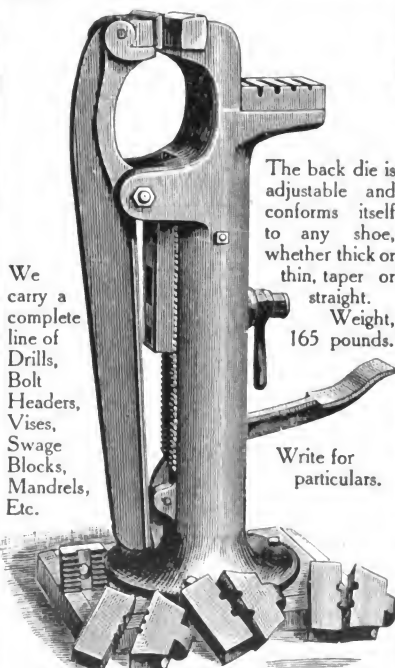
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### A SIGN OF Strength and Quality

#### Foot Vise and Bolt Header

Simple, Strong, Solid and Durable. For Forming, Sharpening and Welding Calks on Shoes. For making bolts and bending and shaping hot iron.



We carry a complete line of Drills, Bolt Headers, Vises, Swage Blocks, Mandrels, Etc.

The back die is adjustable and conforms itself to any shoe, whether thick or thin, taper or straight. Weight, 165 pounds.

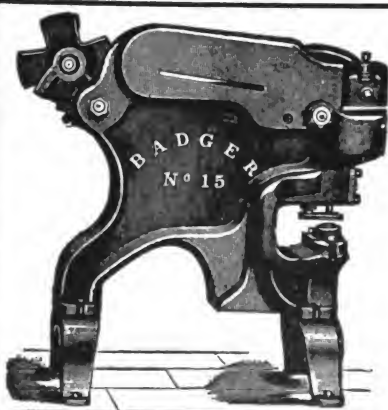
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### Mr. Blacksmith :

Here is a Punch and Shear that will punch and shear just as we say with

#### ONE MAN ON LEVER.

Punch ⅝ in. hole in ½ in. Iron

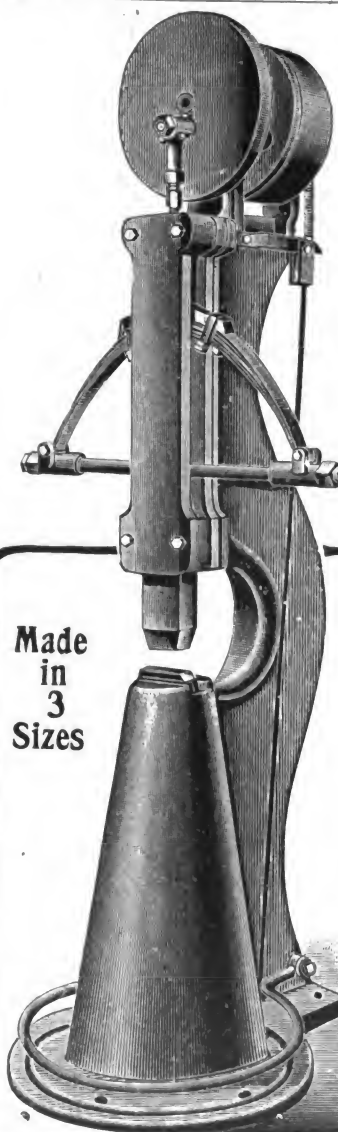
Shear 4 x ½ in. Flat Iron

" 7 x ¼ in. Band Iron

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Write for Prices, Etc.

**Rock River Machine Co.,**  
JANESVILLE, WIS. U. S. A.



Made  
in  
3  
Sizes

### The Perfect Power Hammer

has no equal for simplicity and efficiency. Does a wide range of work from the lightest forging to heavy axle welding. Note the long guides, insuring a direct vertical stroke. No side motion. Easy to operate from the lightest tap to the heaviest blow. The Disk Attachment free. No other Hammer has this advantage. It only requires one Horse Power to run it. Write for prices.

**Macgowan & Finigan Foundry & Machine Co.**  
ST. LOUIS, MO.



"Let the  
Kerrihard  
Hammer  
do Your  
Work."

### The Right Tool at the Right Price

There is a rigid test and a thorough inspection of every part and feature of the Kerrihard Hammer, whereby every possible weak spot is found in the factory and not in your shop.

This practice covers every step from the design and selection of the raw material to the finished product and begets a hammer that is right and stays right.

In it is embodied every modern feature that has proven worthy of adoption and our facilities enables us to present a hammer at a price far below anything approaching it in quality.

An origin, a record and an appearance which sells it almost on sight, a consistent "making good" of every promise quadrupled our sales over last year. We wouldn't mind telling you here just how many we sold only you'd think we were joking. If you want to know what a Kerrihard hammer will cost you, address

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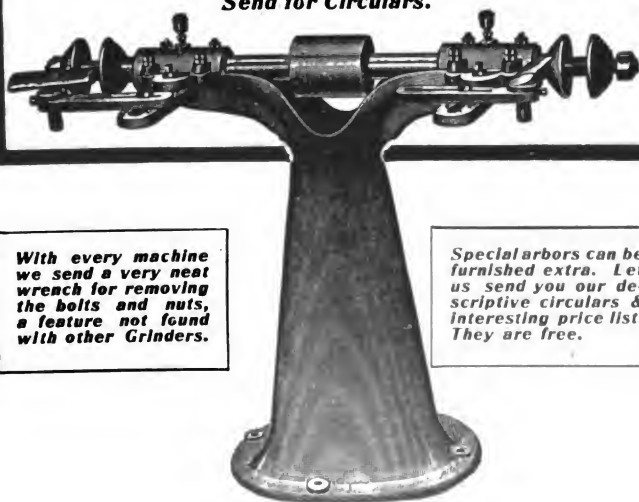
HAMMER AND GRINDER DEPT.,

RED OAK, IOWA, U. S. A.

### OUR NEW EMERY GRINDER

is Especially designed for the Blacksmith Trade. Will Carry Wheels 20 in. in diam., 3 in. thick or smaller with 1 1/4 hole. Price most Reasonable.

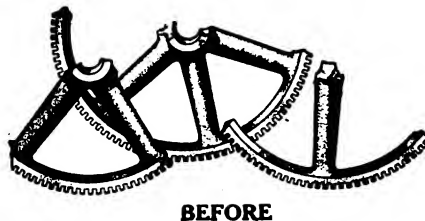
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With every machine we send a very neat wrench for removing the bolts and nuts, a feature not found with other Grinders.

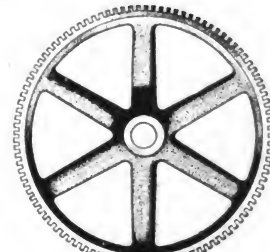
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The  
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Solved

Don't Discard  
Broken Castings.  
Make Them Good  
As New By Using



AFTER

# WELDARINE

It is impossible to patch a broken casting without weakening it.

WELDARINE will do the work and will make a broken casting stronger than it was originally.

Thousands of mechanics in all parts of the world are now using WELDARINE with very gratifying results.

Such expressions as "You can swear by Weldarine," "We could not get along without it," "I have used three sets and have not had one failure," are very common expressions in the letters received by us.

A set of WELDARINE consists of one can WELDARINE, one can Weldarine Fluid, one can Weldarine Spelter, one can Weldarine Borax, one steel wire brush, and is put up in two sizes.

Large set weighs 4 lbs., costs \$4.00, will do from \$75 to \$90 worth of work.

Small set weighs 2 lbs., costs \$2.25, will do from \$30 to \$40 worth of work.

WELDARINE profits are always satisfactory. The WELDARINE job is a "hurry-up" job.

The man who wants a casting brazed is glad to pay for "knowing how" as well as for labor.

WELDARINE is sold by all up-to-date Heavy Hardware Jobbers and Machinists' Supply Houses.

If your jobber is not handling WELDARINE, send us your order and we will forward either set charges prepaid upon receipt of price.

Please give us name of your Jobber when ordering.

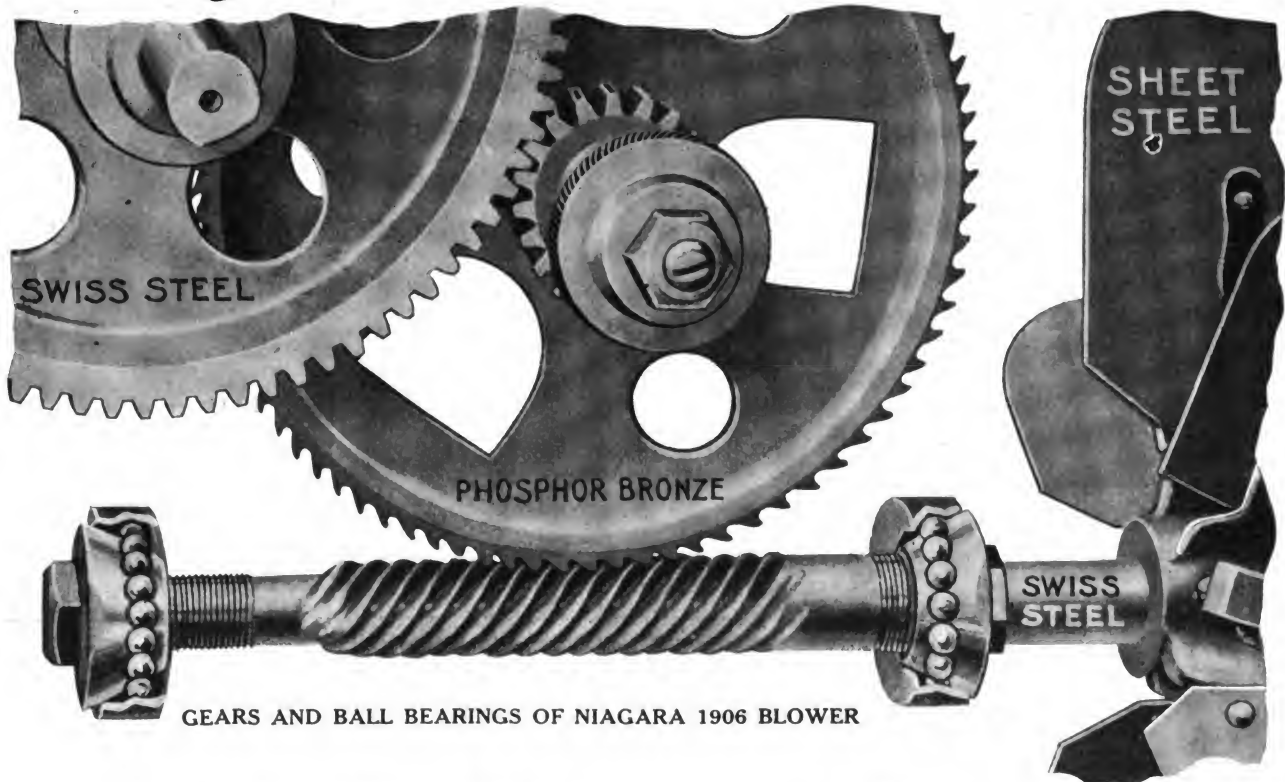
**The WELDARINE MFG. COMPANY,**  
INCORPORATED

Cable Address **III E: Seventh Street,**  
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**TOPEKA, Kansas, U. S. A.**

# Niagara 1906 Blower



GEARS AND BALL BEARINGS OF NIAGARA 1906 BLOWER

***"Like The Noble Grand Niagara"***  
***"The Wonder Of The World"***  
***"The Great Power Producer"***

So many similar commendations have been received from users of our Ball Bearing, Spiral Shaft Blower that we have christened it anew

## NIAGARA 1906 BLOWER

so as not to confuse buyers with cheap imitations. This is too good a blower to bear a name or number that might be taken for a cheap, inferior machine now being widely advertised. Those who have got stuck in buying the wrong Blower have had to pay for frequent repairs. Many such have written us asking if we will build them a set of gears that will not cause such trouble. Therefore we have renamed our wonderful Ball Bearing Blower so as to insure and protect all buyers getting the best machine on the market, in the future. Ask for and insist on having Niagara 1906.



***The New Niagara 1906 Blower***  
***Best In The World***  
***Price Lowest Of Any***

Every user of a Niagara 1906 Blower is protected fully by a company financially responsible. The Niagara gears are made in the largest and best equipped factory in the world—the factory from which all others have endeavored to learn how to build good work. In the Niagara Gears and Bearings, only the finest Phosphor Bronze and Swiss Steel are used. The working parts show as fine workmanship as a watch. The oiling arrangements are perfect and absolutely eliminate friction and wear.

The blast is equally strong when handle is turned in either direction. Each and every Niagara 1906 Blower is furnished with our new center and side blast tuyere which is positively the best of its kind on the market.

Your dealer will quote you a lower price on Niagara 1906 Blower than he can quote you on any other geared hand blower on the market. Notify us of any similar Blower selling at lower price. Send for new illustrated Catalog of Blacksmith Tools. Just out.

## Lancaster Forge & Blower Co. Buffalo, N.Y.

## ENOUGH SAID THE WONDER DISC SHARPENERS

Are being used in 24 States, in Canada and Mexico. Have you a Wonder Disc Sharpener in your shop? Do you want to make money easy? From \$20 to \$25 per day earned with the Wonder Disc Sharpeners.

FOR SALE BY  
LEADING JOBBERS.

MANUFACTURED BY

**A. E. DURNER,**  
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Write for descriptive circular and price list.



For  
Gas or Gasoline

Sizes  
2½ to 30 H. P.

## Greendale Gas Engines.

THE BEST POWER  
For Blacksmith Shops.  
Also adopted for Electric  
Lighting.

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**GREENDALE GAS ENGINE CO.,**  
WORCESTER, MASS.

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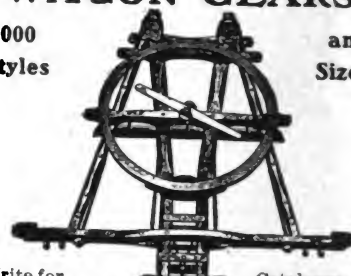
Send for Inventor's Primer. Consultation free. Established 1864.

**MILO B. STEVENS & CO.,**  
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Branches at CHICAGO, CLEVELAND, DETROIT.

## WAGON GEARS

1,000  
Styles

and  
Sizes



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**THE AKRON & SELLE CO.,**  
Akron, Ohio.

## EICHMANN'S Double Lever TIRE PULLER

Is superior to all others for quick work, requiring no trestles nor bench, which saves time, therefore money.



By using this tool it will save you the vexation of breaking up felloes and beating off tires. It is light and very easy to handle, yet powerful. 50 pounds on the lever lifts one ton on the hook. Though made especially for wide tires, yet you can use it as well to remove buggy tires.

For further information write to  
**HENRY G. EICHMANN,**  
BERTHOUD, COL.

## AIR CUSHION RUBBER HORSESHOE PADS



Twelve Different Styles



NO  
LAMENESS  
NO  
SLIPPING  
CHEAPEST  
AND  
BEST



See That Cushion?  
It fills with air at each step. That's what breaks concussion. That's what prevents slipping. That's what keeps the foot healthy. That's what cures lameness.

Heavy  
Leather Back

Medium  
Canvas Back

**REVERE RUBBER CO.**

Sole Manufacturers BOSTON, MASS.

We make the following sizes:  
No. 1 3 in. wide, 14 in. high  
" 2 3½ " 14 "  
" 3 3½ " 10 "  
Price, \$1.65 per set of 4 stks  
Cash with order. Weight, 16 lbs.  
per set.



This shows the  
strength of our  
**STANDARD**  
compared to  
the old style.

## The Bruce Malleable Wagon Standard

This Malleable Iron Bolster Standard has been tested thoroughly, and we guarantee it strictly as represented.

Anyone familiar with the farm wagon will readily see the great advantages of the Malleable Iron Bolster Standard over the old style.

1. Made of the best grade malleable iron. It has been thoroughly tested by factories and wagon makers and pronounced a great success.

2. It is attached to bolster by means of two bolts passing through bolster from the side, and one bolt from top to bottom of bolster, thus holding standard perfectly solid, and at the same time strengthening end of bolster, which in old style is weakened by mortise.

3. The Malleable Iron Standard has a 3 1/2 in. face at base, which prevents wear on wagon box, while the old style has only a 7/8 inch face.

4. Great time saver. Can be attached to bolster in one-fourth the time required to put on wood stave. Adapted to new and repair work. The price will justify all classes of the trade in using this standard.

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Will cut at least one speed faster than any other high  
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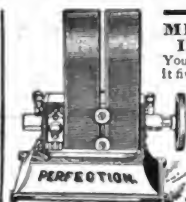
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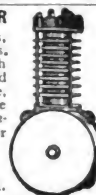
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The "ELI" Gasoline Farm Engine is the only fit engine to have on a farm, where one is a good way from the repair shop. The "ELI" is so simple that there's nothing to get out of order. It will run year in and year out without the tinkering that other engines require. It is the only engine without cams, gears, and levers. We call it "Fool-Proof" because, if some simpleton or a child should monkey with it, he couldn't make it dangerous. It is absolutely safe. Isn't that the kind of an engine YOU want? Then write for our free booklet, telling how and why it is so simple and safe.

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with three ton load with any wagon. Works without two sizes.

Blacksmiths, wagon and buggy repairers especially, will see at a glance the merits of this axle cutter and appreciate its usefulness.

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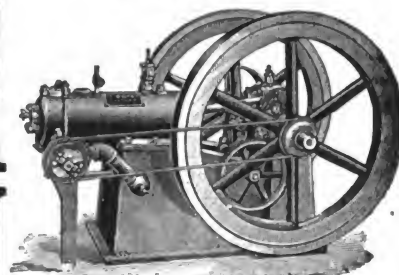
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For Plow Work, Wagon Work, Heavy Work, Any Work.

"We have been using your Boss trip hammer for over a year and will say that to do without it would end the business for us as we have a great deal of plow work and to go back to the old method of drawing out a share would discourage me so much that I would quit the business. Any man having power should by all means have a Boss hammer." H. J. DUBBS & SON, Ransom, Kas.

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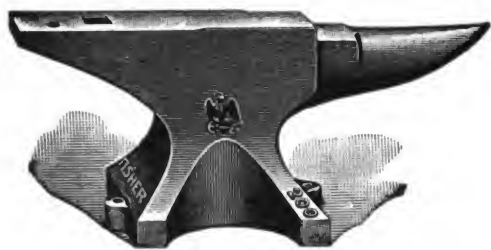
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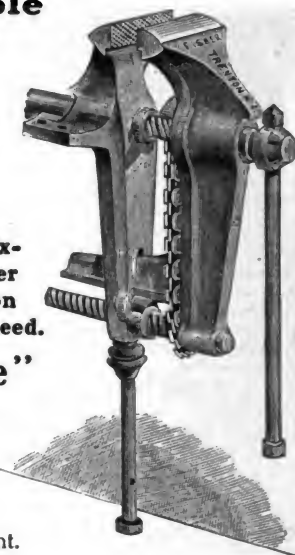
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IN THE MANUFACTURE OF  
**ANVILS AND VISES  
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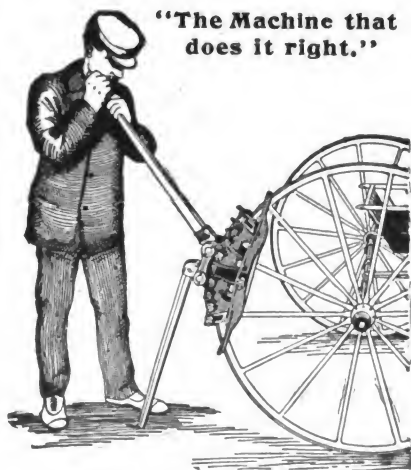
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Is sold by Reliable Dealers Everywhere. For Strength and Durability there are none better made. The "FISHER" is acknowledged the Best for Blacksmiths.

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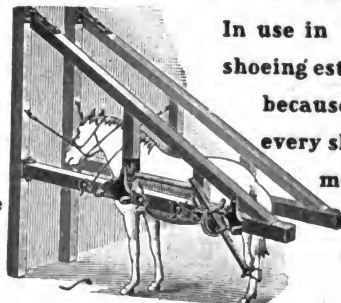
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Every one  
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guaranteed.  
All of the  
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In use in all modern  
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because they fill  
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satisfaction  
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are simple, strong, solid, safe and sure to hold. No ropes or pulleys to tangle or break, no bracing to roof or floor, but furnished complete ready to bolt to the stationary posts in your shop. You can rely on the BARCUS STOCKS every time.

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Has a record of five toes per minute, and this machine in your shop will save you in cash at the rate of \$6.00 per day when in use.

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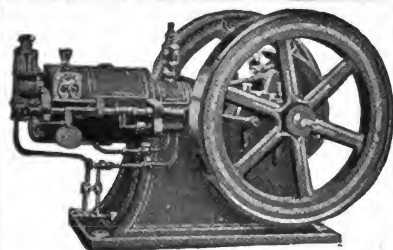
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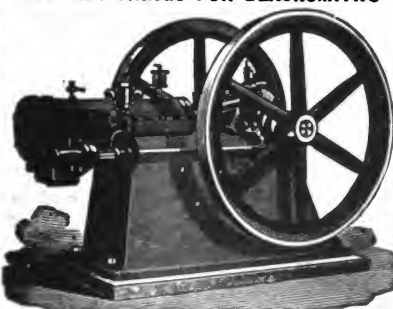
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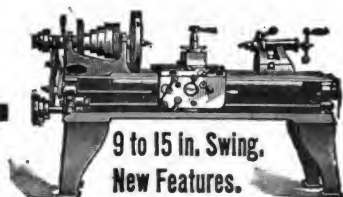
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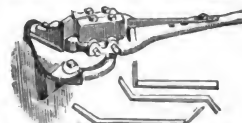
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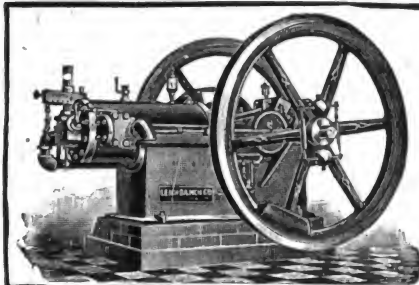
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MADE IN ALL SIZES.

Built especially for Blacksmith shop power. It means money in your pocket to find out about our engines before placing your order.

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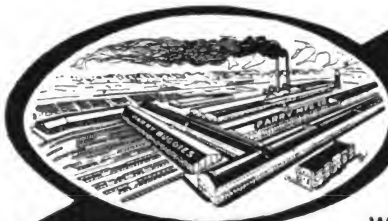
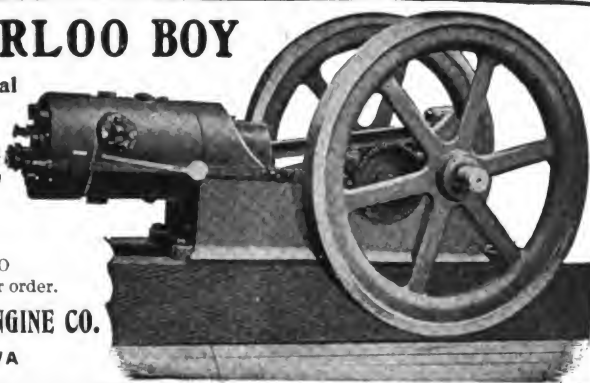
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3½ to 4 H. P.

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The Engine Is Right!  
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LARGEST AND BEST EQUIPPED  
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EVERY VEHICLE  
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A Monthly Illustrated Technical Journal circulating amongst Coachbuilders, Wheelwrights and Blacksmiths throughout the Commonwealth of Australia, New Zealand and South Africa.

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For Brazing Wires  
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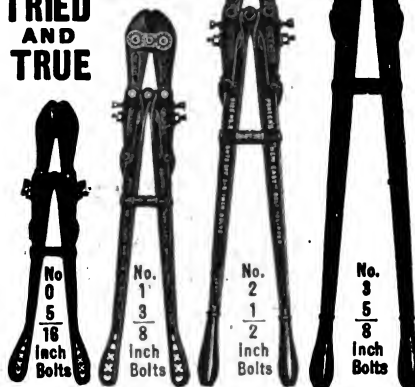
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WITH 4-IN. TIRE STEEL WHEELS

Our wagons are well ironed throughout—wheels made with sound staggered spokes.



We make any size wheels to fit any skein.  
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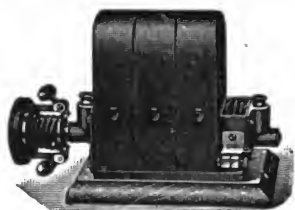


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It is better and more durable than any Dynamo. Its Governor regulates the speed regardless of speed of Fly Wheel. Its Governor adjusts to imperfect Fly Wheels. Its Governor insures a constant and uniform spark. The spark does not burn the contacts of the engine. All strains are removed from the bearings of Magneto. FULLY GUARANTEED. AGENTS WANTED.

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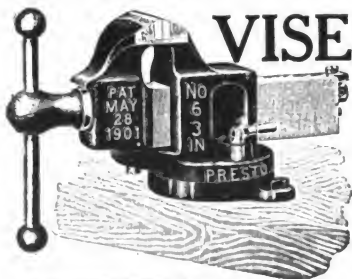


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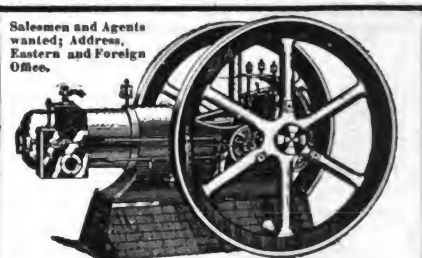
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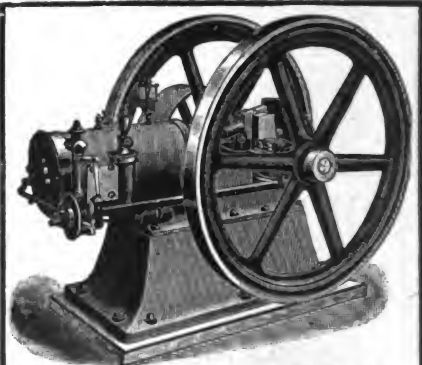
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A wheel that will do the work  
in one-fourth to one-half less  
time is by far the cheapest  
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that will save only one  
hour per day during  
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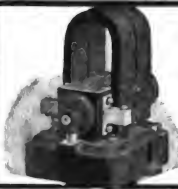
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They're made  
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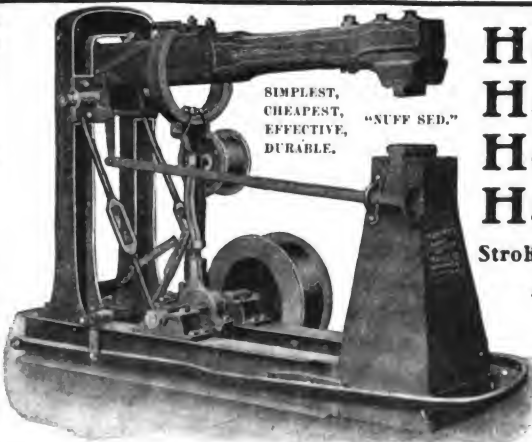


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Cools tires quickly. No burnt  
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Can be raised and lowered in  
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Stroke adjustable while running.

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Is the simplest, most durable,  
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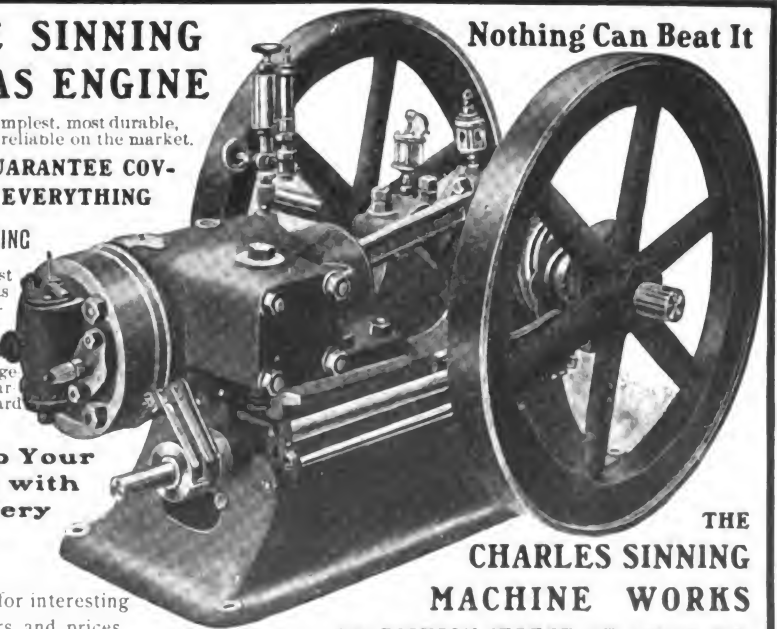
**OUR GUARANTEE COV-  
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is cheapest  
to run, has  
few work-  
ing parts,  
all of  
which are  
interchange-  
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ings all hard  
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**Equip Your  
Shop with  
the Very  
Best**

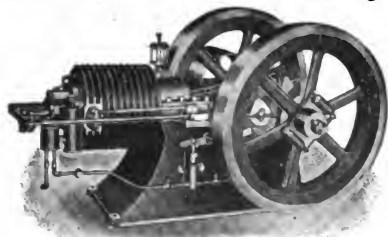
Write for interesting  
circulars and prices.



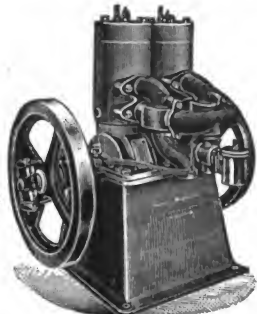
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Made in 2, 3 and 6 horse power sizes. What's the use of paying good money for an old style engine, when you can get something better in the "Gade Air Cooled" at the same cost. Buy one. It will not freeze up or go back on you in cold weather. It's ready for business all the time. We know it will please. By all means write for descriptive circulars and price list of the "Gade." Address. **GADE MFG. CO., Iowa Falls, Iowa.**

**The Maxwell & Fitch Gasoline Engine**

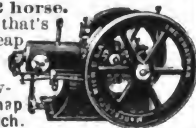
Two cycle, a power impulse every revolution, we use no gears, cams, cam shafts, valves or valve springs, no engine can be simpler or more durable. If you want a well built engine, one built of the best materials, then just send us a postal for our catalogue and price list.

**THE MAXWELL & FITCH CO.**  
ROME, N. Y.

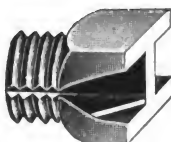
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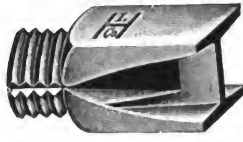
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He wanted a good one, that's why he didn't buy the cheap kind, but bought the simplest, strongest, and best designed, for the lowest possible price of H.L. Chapman Box A.B. Marcellus, Mich.



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Armature incased in WATER-PROOF non-corroding brass tube. All brass screws. Friction, Belt or Governor drive. Brush holders removed without loosening screws. All parts polished brass. Contact and Jump Spark. A TRIAL WILL CONVINCE YOU. Most popular and satisfactory Magneto on the market. Price as popular as Machine.

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the only practical lock neckyoke on the market. None better for safety and durability. Very handy for repair work. Have you tried them? Ask your jobber for them.

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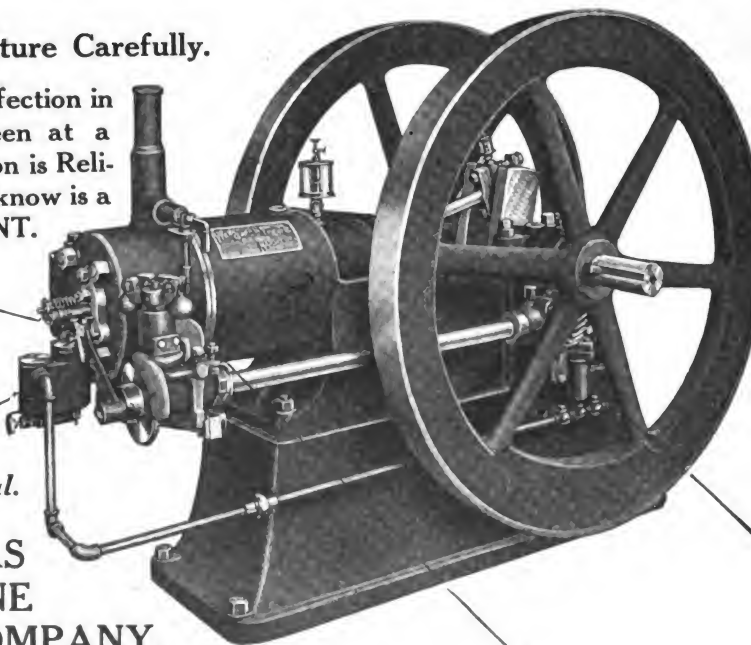
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Bearings are Frictionless Metal.

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We have been using one of your 6 H.P. Weber engines for eighteen months, driving a power blacksmith shop. We run a trip hammer, band saw, a 14 in. circle saw, an emery stan 1 with two stones, a 14 in. rock, and one 10 in. rock, one turning lathe, 12 ft. bed, one large drill press, three fires, one 14 in. fan and wood lathe. We hitch all this machinery on at one time and have a surplus of power, enough to pull this machinery more. This engine is the simplest to operate I have ever seen. There are ten Gasoline engines in our town, mostly Webers. My brother has just completed a power shop ready for work, which he will operate with a 6 H.P. Weber engine.

Yours very truly,  
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**This Gasoline Pump Reduces Cost of Insurance.**

Your Fingers will turn GOVERNOR NUT to adjust SPEED, and you **DO NOT NEED TO STOP ENGINE.**



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for all time is the....  
**Metal Wheel**

We make them in all sizes and varieties, **TO FIT ANY AXLE.** Any height, any width of tire you may want. Our wheels are either direct or stagger spokes. Can **FIT YOUR WAGON,** Perfectly without change....  
**NO BREAKING DOWN**  
no drying out, no resetting tires  
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Ignite your engine with our  
**IMPROVED I. C. C.**  
**JUMP SPARK COILS**  
We guarantee them against all imperfections in workmanship and material. Write us if your engine doesn't work properly.  
**INDUCTION COIL CO.,**  
COILS FOR BLACKSMITHS. MILWAUKEE, WIS.

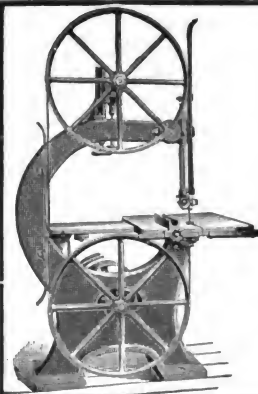
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We also make Hot Pressed and Cold Punched Nuts, Bar Iron, etc.



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Wood Working Machines in your Shop will enable you to do better work and more of it than you can do with hand tools.

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in this.**

**T**HE next volume of The American Blacksmith will be bigger and better than ever before, and to secure good practical reading matter for this larger paper, we offer a prize of \$5.00 each for the five best articles of any length on any subject connected with the smithing craft.

To all other contestants whose articles are accepted and published, a year's subscription to The American Blacksmith will be given.

The articles may be on any practical shop topic. Your manuscript can be submitted at any time between now and December 10th.

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who is learning new kinks, and we want to tell our readers about them.

**OPEN TO ALL:**—Any person can submit as many articles as desired, thus increasing his chances of a prize or prizes. Each manuscript should be plainly written and on one side of the paper only. All articles must be headed "Prize Contest." If you desire to submit more than one article, all need not be sent at the same time. A good suggestion is to write your articles as you come across the new devices or think of ideas of value to the craft. Remember that each published article wins a prize. Send in as many articles as possible and increase your chances for one of the big prizes.

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A  
Practical  
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Giant Grip Shoes and Calks are drop-forged from the best material obtainable, and satisfaction is guaranteed if the goods are properly used.

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Will quickly pull on a heated tire and finish it. Will save the rims and keep them from splitting. Weight 15 lbs. Fully guaranteed.

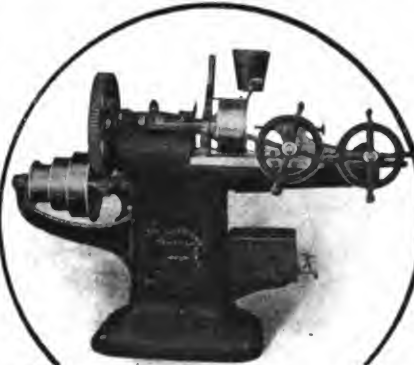
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IRON  
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ADJUST-  
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Works automatically, simple and reliable. See advertisements in previous issues. Write for circulars, sent free.

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Four Pounds Fine Sand.  
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Welds sell for 50 cents per package, but in order to have you try it I will send a 50 cent package prepaid for only 14 two cent stamps.

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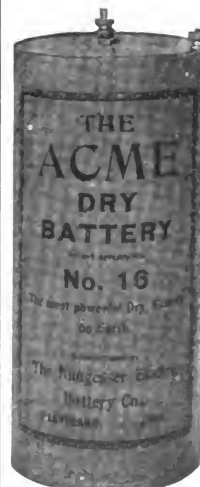
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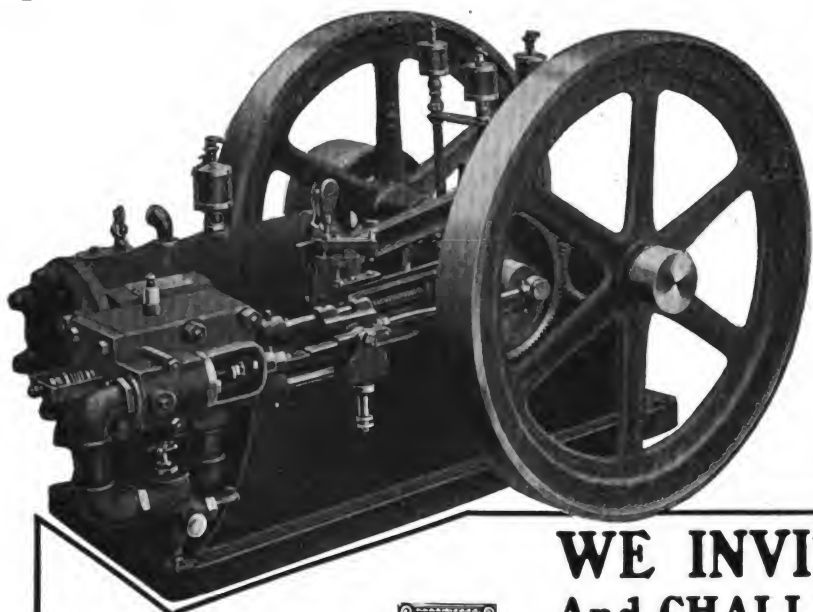
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2 to 25 Horse Power.

*Always Ready to Start.*

*No Engineer Required.*

*No Increase in Insurance  
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The Best on the Market  
for the user of small  
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WILLIAMSPORT ENGINES are constructed by the most skilled workmen, and only the very best material used. We offer you an Engine of the Finest Quality, noted for its Simplicity, Durability, Ease of Operation and Beauty of Design. Our broad Guarantee covers all.

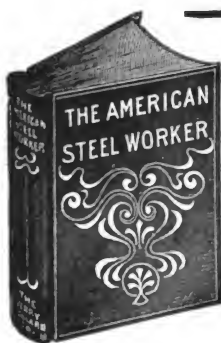
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All Engines Absolutely Guaranteed free from all defects in workmanship and material. Any part found defective or faulty will be replaced by us free within one year from date of purchase.



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Writes a blacksmith. Lots of others say so, too. Markham has been hardening steel for 27 years and studying it all the time. He tells in plain English just how to handle each case. Shows the best methods; but if you can't get them, it tells you how to do good work with what you have.

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In looking over our ledger we are gratified to find that some of our most prosperous agents started in as blacksmiths, handling the Moline Wagon on the side.

They had the acquaintance of the farmers just as well as the dealer in town and soon discovered that being in business paid

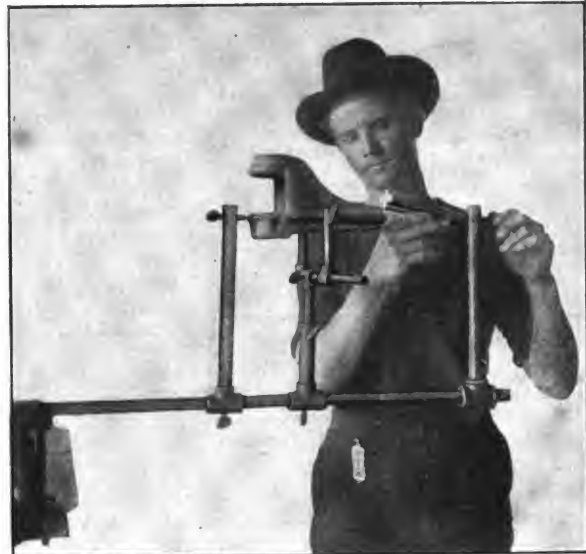
### Better than Working at the Forge

and so have quit the trade long ago, finding themselves prosperous merchants today.

We have some uncovered territory and if you have an ambition to get on in the world, it may be that this is the opportunity for you. Address

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Nearly as bad as a wagon without a tongue. You have had experience and know. It's hardly necessary to tell you again but it's so true that you cannot braze one-third the castings that you would like to braze, that we cannot help saying so for fear that you may have never bought any Brazing Compound and think when you get the compound you have the brazing problem solved. It is not so, your troubles have just begun. No compound will hold the work and it has to be held. The photographs here show a casting that weighed 10 lbs. that was brazed in ten minutes. He got one dollar for that piece of work. The customer saved two days time, twenty-five cents telephone, forty cents expressage. The casting would have cost two dollars. The Blacksmith made a Dollar and a friend too, all done by owning a "LONE STAR BRAZING HOLDER" about the simplest device imaginable but the most practical. It will hold most any odd shaped casting, circular, half-circle, zig zag, it's adjustable to any kind. This tool is so simple and does its work so well you will say when you have seen and tried one, "Now why didn't I think of this." We did though and patented it. We sell the Holder Complete with Compound for \$10.00, Holder only \$6.00. Compound only \$4.00, charges paid when the money is remitted with the order. We will send any reliable Smith a Holder and the Compound on trial on receipt of two dollars and if it will not do what we say it will you can express it back. We have experimented with the various compounds and know that the LONE STAR (which is patented), will do the work in a way which no other will.

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## THE LONE STAR BRAZING CO.,

MANUFACTURERS LONE STAR BRAZING HOLDER AND COMPOUND,

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**Vehicle and Automobile Bows**

**DEATH TO HEAVES! NEWTON'S**  
GUARANTEED  
  
Heave, Cough, Dis-temper and Indiges-tion Cure will effect a permanent cure for the ailments named. Recom-mended by veterinarians and owners. Every drug-gist in America has it or can get it.  
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**Ball Bearing**  
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Rip Saw, Band Saw, Boring and Spoke Tenoning Machine all in one. Each attachment ready for instant use, either for foot, hand or belt power.  
Write for circulars and price list.  
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Direct connected, has been designed especially for the blacksmith and it is his ever ready helper that works for less than five cents a day, it never tires. It places him on equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.  
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**TWILIGHT AND DAWN**  
  
The D. & B. Line Steamers leave Detroit weekdays at 5:00 p. m. Sundays at 4:00 p. m. (central time) and from Buffalo daily at 5:30 p. m. (eastern time) reaching their destination the next morning. Direct connections with early morning trains. Superior service and lowest rates between eastern and western states.  
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Send two cent stamp for illustrated pamphlet. Address, A. A. Schantz, G. S. & P. T. M., Detroit, Mich.  
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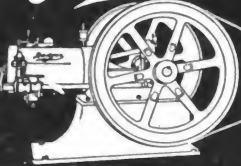
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All Sizes  
Get our proposition.  
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**\$47.50**  
AND UP.  
Dealers Only.  
  
Strictly First-Class Material.  
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The Goodson Igniter is guaranteed to produce a sufficient spark to start a gas or gasoline engine without batteries or spark coil.  
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"The world's standard for efficiency."  
**BADGER GASOLINE ENGINES**  
**Turn Time Into Money**  
Badger Engines enable the blacksmith to make the most money out of his time by enabling him to do more, better and a greater variety of work, and at the same time employ less help—saving cost of helpers.  
The "Badger" stands for superior excellence and efficiency the world over.  
Badger Engines are easy to start and to keep going; cost almost nothing for repairs and last a life-time. They are as cheap as is consistent with best skilled work-manship.  
Send at once for our Fine Book, illus-trated in colors—It's FREE. It tells all about Badger Gasoline En-gines, and why they are the best on earth for the Blacksmith. Write to-day, before the books are gone.  
Special discount to Black-smiths who take an agency.  
Write for attractive terms.  
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**IGNITING DYNAMOS**  
Excel All Others!  
The only generator that cannot lose its magnetism. For either make and break, or jump spark work. Also spark coils. Send for Catalogue B.  
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**BUILT TO STAND**  
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A well-made, accurate machine; especially adapted to run by gasoline engine; capable of all kinds of band-sawing, particularly carriage repair work. These are a few of the fine points of Marston's Band Saw.  
We will gladly send Prices and Circulars. Drop us a Card today.  
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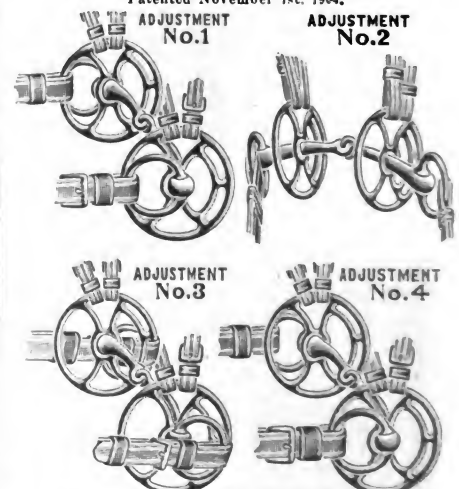
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The above cuts illustrate the four different adjustments all made by changing the manner of fastening the lines. Bits sent on ten days' trial. PROF. JESSE W. BEERY, Pleasant Hill, Ohio.



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## FOR YOUR 1907 CALENDARS

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This illustration shows merely the design. The calendar itself is  $11\frac{1}{4}$  by  $14\frac{1}{4}$  inches and is a most artistic reproduction in ten colors of an exceptionally beautiful water-color painting valued at \$1,000. It is a very appropriate smithy subject and every one is delighted with its bright and artistic colorings. This calendar is not to be confounded with the cheap stock calendars with which the market is flooded each year: The American Blacksmith has exclusive rights to the use of this painting and no one else in your neighborhood will have one exactly like it.

In accordance with its usual custom The American Blacksmith will present a copy of this beautiful 1907 calendar to every reader whose subscription is paid to or beyond January, 1907. If your subscription expires before January, renew now and make sure of receiving one.

For those readers who desire a supply of calendars to advertise their own business, we have secured a few extra ones and offer them in small lots at a price that just covers our expenses. The calendars will bear no advertising except your business card. This we will either print on your calendars or will furnish you with a three line rubber stamp and an inking pad without extra charge. You can then stamp your name on your calendars and also use the stamp for other purposes. These calendars are offered to SUBSCRIBERS OF THE AMERICAN BLACKSMITH ONLY and to induce readers whose subscriptions expire before January to renew promptly and take advantage of one of the following liberal offers:

- |     |  |        |
|-----|--|--------|
| (1) | 50 Calendars postpaid (for subscribers only) | \$2.25 |
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Prices include postage or express charges. But you will need to **SPEAK NOW**. The supply is limited and some are sure to be disappointed. If you want a supply reserved for you, order today—a postal will do. Payment can be made later if desired.

## American Blacksmith Company,

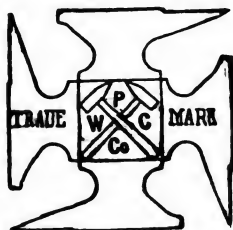
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*To Make a Strong, Clean Weld If You  
Use Perfection Welding Compound.*

We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



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**PRICE CONSISTENT WITH QUALITY.**

**PERFECTION WELDING COMPOUND CO., SCRANTON, PA.**

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KNOW A GOOD THING**

and will buy none but

**"STERLING" HACK SAWS**  
**They're Best by Test.**

IF YOU WANT RETURNS FOR YOUR TIME AND TROUBLE  
SELL STERLING BLADES.  
DIAMOND SAW & STAMPING WORKS, BUFFALO, N.Y. U.S.A.

LOWER SALEM, Ohio, April 27, 1906.  
Buffalo Forge Co.,  
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Gentlemen:

I bought one of your No. 200 Buffalo Blowers last summer and am well pleased with it. It is the easiest running machine I ever worked, and I can heat large iron with it the quickest of any machine I ever operated. I am well pleased with it.

Yours truly,  
A. E. HARRIS.

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Steam Cooled  
Double Piston  
No Foundation

Send for Catalogue  
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Set Tires Cold.  
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KEOKUK, IA.

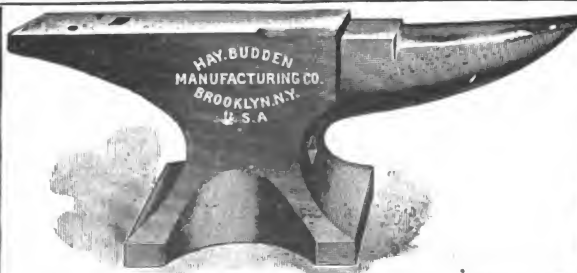
**HAY-BUDDEN SOLID WROUGHT ANVILS**

**The Gold Medal Anvil  
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Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS



**OVER 100,000 IN USE**

**WARRANTED**

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# AMERICAN BLACKSMITH

BUFFALO  
N.Y. U.S.A.

A Practical Journal of Blacksmithing and Wagonmaking

SEPTEMBER, 1906

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sell only to Horseshoers.

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# Some Day You Will Write Us.

**S**OME day you will write us for our booklet "Carriage Maker and Blacksmith Tools." Don't say you won't, for that would be a slander on your business judgment.

"But how do you know?" you ask. Because it will cost you only a penny for a post card and it may mean many dollars to you. Now, will you spend the penny and save the dollars, or will you save the penny and lose the dollars? You'll spend the penny, of course. That's how we know you'll write us some day.

When you are thinking of how to increase your profits, when you're worrying over how to cut down expenses, when you're fretting about your wasted time and materials—that's when you should spend the penny for the post card. Then do it—right then. Don't be "penny-wise, pound-foolish." Don't save the penny and lose the opportunity.

We mention only a few of our machines here. Send for booklet for full information.

**BAND SAWS**—neat, new designs, substantial construction, table adjustable to different angles up to 45° for bevel sawing; used for cutting cloth, ice, cardboard, sheet metal, brass, etc.; several sizes.

**DRILLS**—Post, Swing and Bench Drills, hand and power. Every wanted size. New, simple, efficient and positive; for shops and small factories, smith shops, repair shops, iron furnaces, carriage and wagon shops.

**NEW TAPER HUB BORING MACHINES**—centre the hub instantly and accurately; instantly adjusted for taper or straight bore.

**PORTABLE FORGES**—in all sizes and prices—light-running, convenient, durable and economical—real money savers.

We want to prove the merits of these and our other machines. Ask us for our booklet "Carriage Maker and Blacksmith Tools." It's free.



Fig. 925.

SILVER'S PORTABLE FORGE.



Fig. 850.  
SILVER'S  
BASE DRILL.

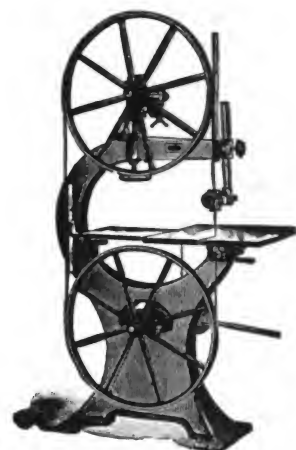


Fig. 822.  
SILVER'S POWER  
BAND SAW.

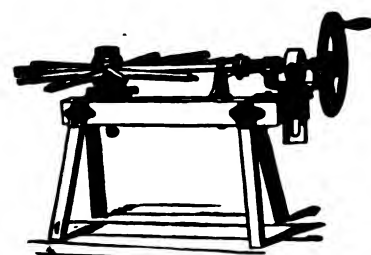


Fig. 718.  
SPOKE TENON MACHINE.

MANUFACTURED BY

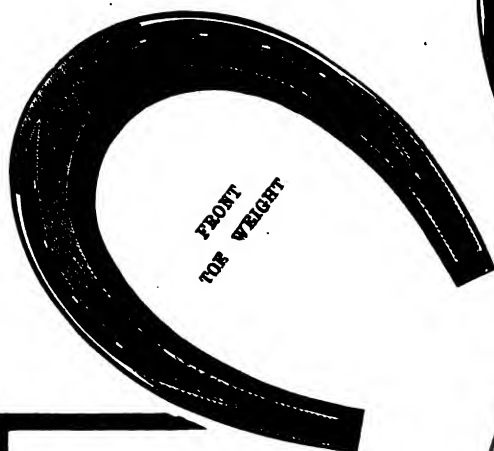
## The Silver Mfg. Co.

365 BROADWAY.

Salem, - Ohio.



★**PERKINS**★  
HORSE SHOES  
AND  
TOE CALKS  
THE STAR BRAND



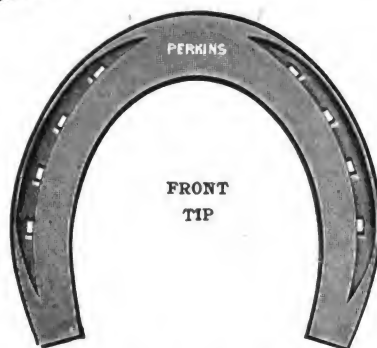
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HORSE SHOES  
AND  
TOE CALKS  
The **SUPERIOR** Kind



**PERKINS**  
**SHOES**

Have more points of superiority than any other make. An up-to-date shoe for up-to-date Blacksmiths. .

OUR  
Complete  
Catalogue  
SENT FREE.  
Write Today. .



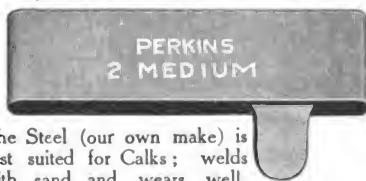
**PERKINS**  
**SHOES**

Are acknowledged by all users to have no equal. Made in all Styles and Sizes. Sold at Reasonable Prices.

Send  
for Samples New  
Pattern Front  
Extra Light and Light.  
Free for asking.

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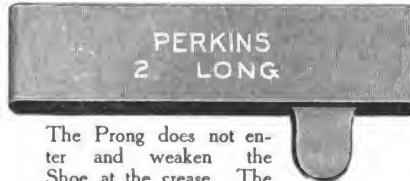
Made in Medium and Long, both blunt and sharp. Packed in 25 lb. boxes.



The Steel (our own make) is best suited for Calks; welds with sand and wears well. Perfectly graded in Length and Size.

**TOE CALKS**

Chisel Pointed Prong. These cuts show exact size of No. 2. SAMPLES SENT FREE.

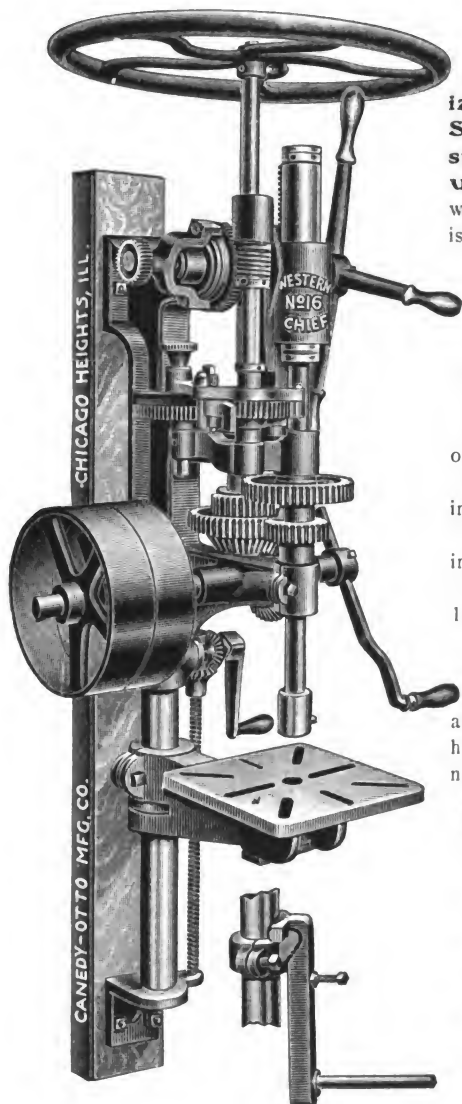


The Prong does not enter and weaken the Shoe at the crease. The only slightly curved Calk sold.

MANUFACTURED BY

**RHODE ISLAND PERKINS HORSE SHOE COMPANY**  
**PROVIDENCE, RHODE ISLAND.**

# No. 16 = Western Chief Drills = No. 17



## DESCRIPTION

Hand Lever Feed, also Horizontal, Gear Driven Positive Self Feed, changeable instantly to fast, slow or medium speed as desired. These feeds work independent of each other and bit is lifted quickly.

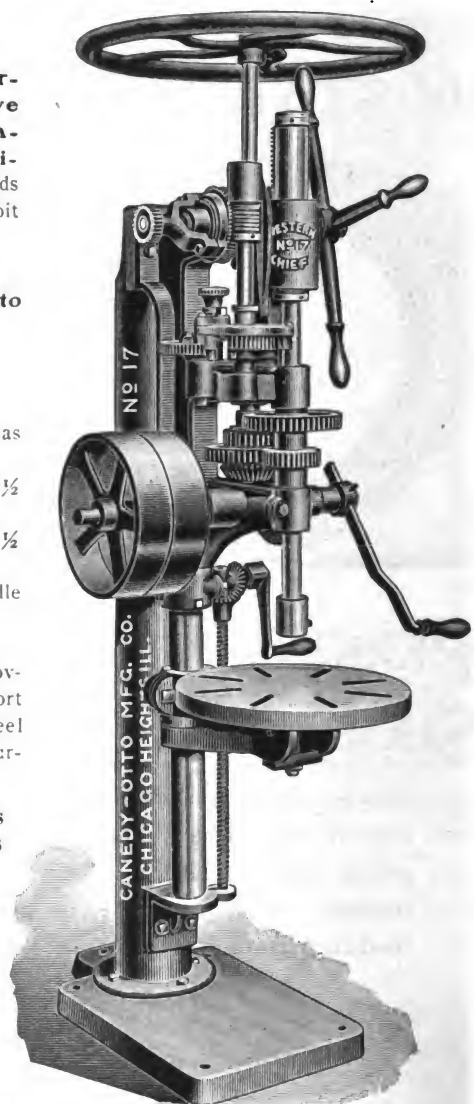
### Cut Gears.

Raise and lower device to table

Drills to center of 24-inch circle.  
Bores from 0 to 1½ inch.  
Takes Bits ½ or 41-64 Shank as ordered.  
Spindle has up and down run of 8½ inches.  
Table has up and down run of 15½ inches.  
Greatest distance from table to spindle 18½ inches.

Wheel rims can be drilled by removing table and using the forked support as a wheel holder. A special wheel holder attachment as illustrated is furnished when desired.

No. 16, Weight 360 pounds  
No. 17, Weight 560 pounds

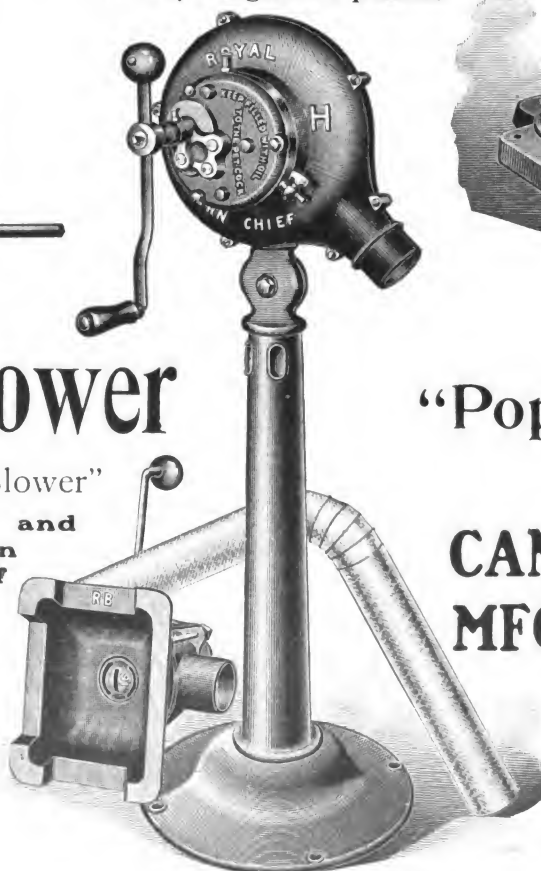


## Royal Blower

"The Successful Blower"

Gear case is oil-tight and dust-proof. Gears run in a continuous bath of oil. No spiral gears, worm gears or ball-bearings. Crank turns forward or backward. Fan 12 inches. Weight 135 pounds.

Fire pot is 8x9 1-2x4 inches inside.  
Needs no Clay.



Some  
"Popular Tools"

Made by

**CANEDY - OTTO  
MFG. COMPANY,**

Chicago Heights, Ill.

FOR SALE BY  
First-Class Dealers  
EVERYWHERE.

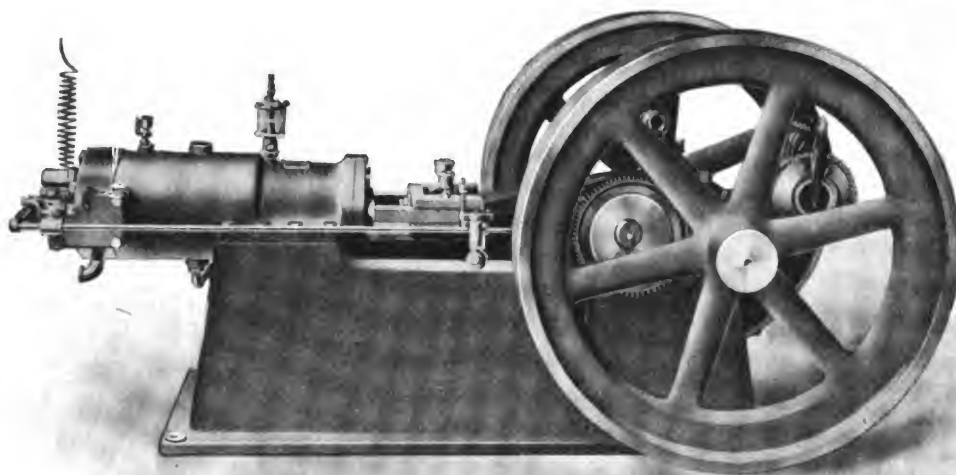
## The Robertson Straight Line Gas and Gasolene Engines

Are the most modern engines on the market. They are the simplest in construction. Most durable. Easiest to operate. No battery used. A sure go every time. More reliable than steam.

**SEE THAT CROSS HEAD.  
STRAIGHT LINE PISTON.**

No worn cylinders. No loss of fuel.  
Full compression—this means power at least cost.

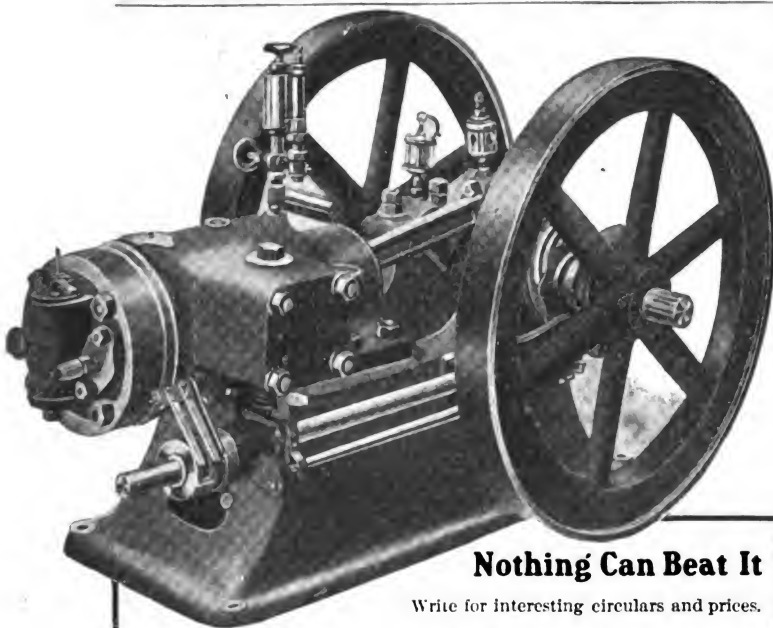
Geo. Krebs, N. Y., writes: "My 4 H.P. bought from you is a daisy, costs me 1 1/2¢ per hour for fuel."  
Hamilton Bros., "Our 8 H.P. is the finest power we ever had. Simply O.K."



Mr. Eric Kuehl of Corona, Cal., writes: "The 6 H.P. engine I bought from you is a peach. Runs like a sewing machine on No. 1 distillate, costs me 4 cents, saving \$1.10 per day over my old 8 H.P. If a party never saw a gas engine, yours is the kind to buy."

It will be worth \$100.00 to you to place your order with us before Jan. 1, 1907.  
You don't want to buy an engine every year. Buy a Robertson, the kind that will outlive 5 others.  
Write us, stating the size you want and kind of fuel, and we will satisfy you.

**The Robertson Mfg., Co., Buffalo, N. Y., U. S. A.**



**Nothing Can Beat It**

Write for interesting circulars and prices.

### THE SINNING GASOLENE ENGINE

Is the simplest, most durable and most reliable on the market.

**OUR GUARANTEE COVERS EVERYTHING.**

**THE SINNING** is cheapest to run, has few working parts, all of which are interchangeable. Bearings all hard bronze.

**Equip Your Shop with the Very Best.**

**THE CHARLES SINNING MACHINE WORKS,**

242 Dickson Street, ST. LOUIS, MO.



**DO YOU  
WANT \$5.00?**

**Every Craftsman  
will be interested  
in this.**

**T**HE next volume of *The American Blacksmith* will be bigger and better than ever before, and to secure good practical reading matter for this larger paper, we offer a prize of \$5.00 each for the five best articles of any length on any subject connected with the smithing craft. To all other contestants whose articles are accepted and published, a year's subscription to *The American Blacksmith* will be given.

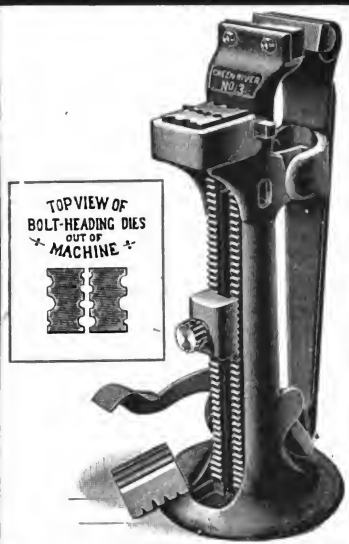
The articles may be on any practical shop topic. Your manuscript can be submitted at any time between now and December 10th.

### It's the Man in Every-day Harness

who is learning new kinks, and we want to tell our readers about them.

**OPEN TO ALL:**—Any person can submit as many articles as desired, thus increasing his chances of a prize or prizes. Each manuscript should be plainly written and on one side of the paper only. All articles must be headed "Prize Contest." If you desire to submit more than one article, all need not be sent at the same time. A good suggestion is to write your articles as you come across the new devices or think of ideas of value to the craft. Remember that each published article wins a prize. Send in as many articles as possible and increase your chances for one of the big prizes.

**The American Blacksmith Co., BUFFALO, N. Y.  
Box 974.**



# NO. 3 GREEN RIVER

## Shoeing Vise and Bolt Header.

The season of 1906-7 finds us on hand with a stronger and better shoeing vise than ever before.

**NOTICE!!** Now furnished with a jaw  $6\frac{3}{4} \times 1\frac{3}{4} \times 1\frac{1}{2}$  inches, made of the Best Cast Steel.

Other parts strengthened and improved.

**4 POINTS  
TO  
REMEMBER.**

It is the "STRONGEST" vise on the market.  
It is the "HEAVIEST" vise on the market.  
It is the most "CONVENIENT" vise on the market.  
It is the "CHEAPEST" vise on the market.

Send for Catalogue No. 33 D and Circulars.

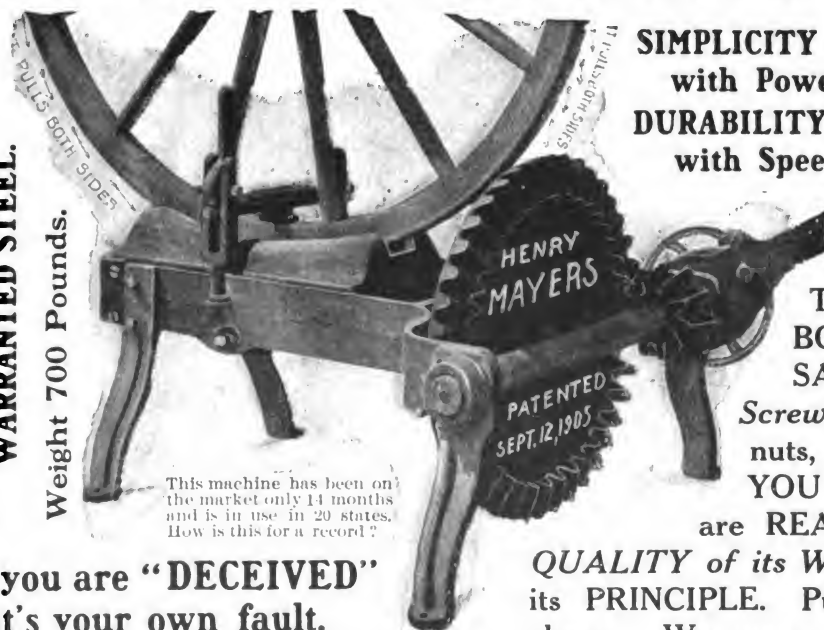
MADE BY

**WILEY & RUSSELL MFG. CO.** GREENFIELD, MASS.  
U. S. A.

# MAYERS COLD TIRE SETTER.

EVERY OUNCE, PIECE and PART  
WARRANTED STEEL.

Weight 700 Pounds.



This machine has been on the market only 14 months and is in use in 20 states. How is this for a record?

**SIMPLICITY**  
with Power.  
**DURABILITY**  
with Speed.



The PRINCIPLE of bringing BOTH HEADS together at the SAME TIME by means of a Screw with Right and Left handed nuts, by Powerful bevel gears, YOU can see, is **RIGHT**. WE

are READY TO PROVE that the

QUALITY of its Work is even BETTER than its PRINCIPLE. Put us to the Test. Talk is cheap. We mean business and have a plain proposition to offer.

If you are "DECEIVED"  
it's your own fault.

"WE ARE FROM MISSOURI AND ARE  
READY TO SHOW YOU."

**HENRY MAYERS MACHINERY CO.,**

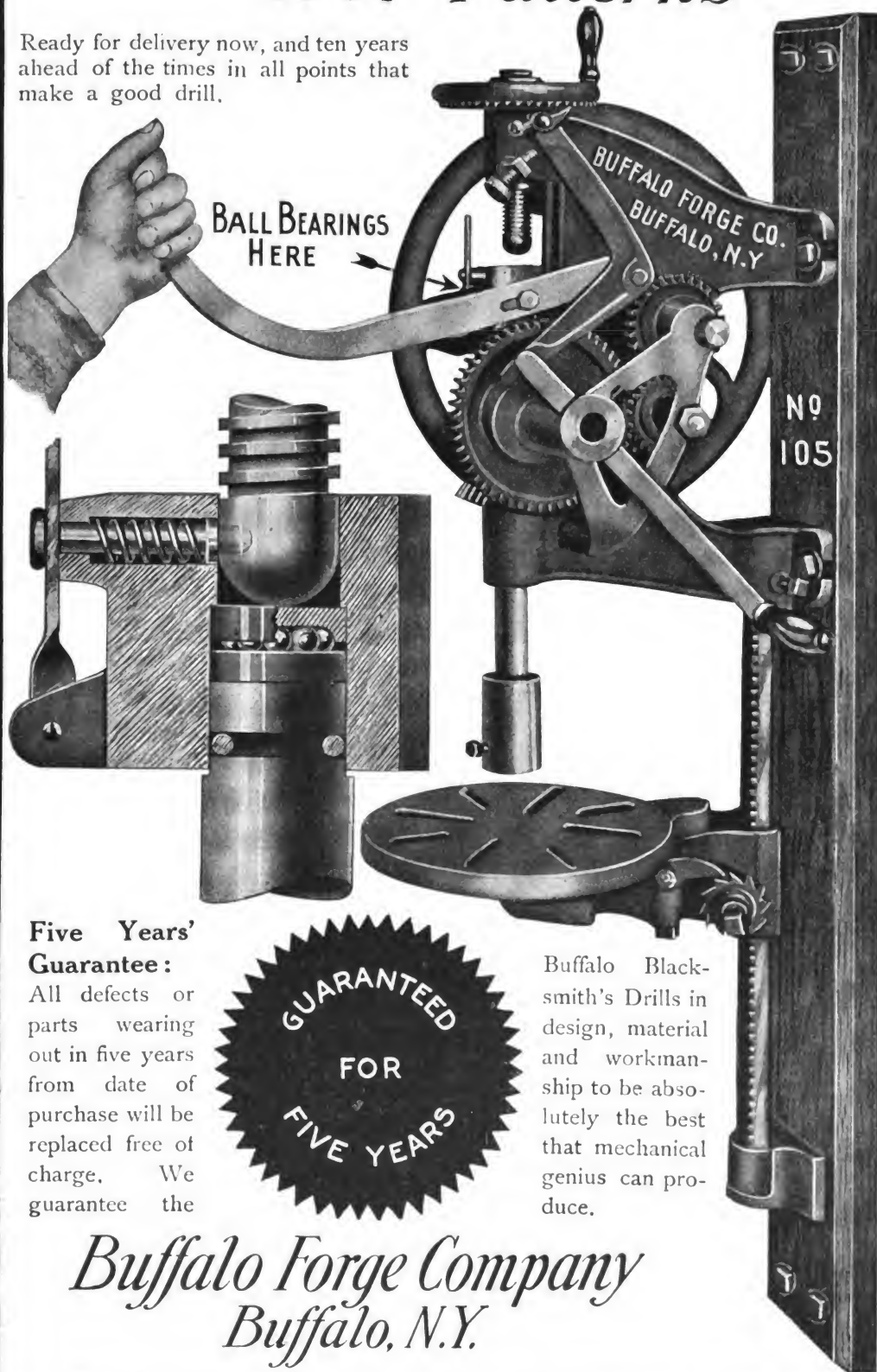
1721-23 North Eighth St.,

ST. LOUIS, MO.



# Buffalo Ball Bearing Drills 1907 Patterns

Ready for delivery now, and ten years ahead of the times in all points that make a good drill.



## Five Years' Guarantee:

All defects or parts wearing out in five years from date of purchase will be replaced free of charge. We guarantee the



Buffalo Blacksmith's Drills in design, material and workmanship to be absolutely the best that mechanical genius can produce.

*Buffalo Forge Company*  
*Buffalo, N.Y.*

Canadian Buffalo Forge Co., Montreal, Canada.

## BUFFALO 1907 DRILLS.

5 Sizes  
5 Capacities  
5 Prices

Send for Photographs

Designs are  
New  
Strong  
Simple  
Durable  
Original  
Jig Made  
Practical  
Symmetrical  
Extra Heavy

## Features:

Two Speeds  
Lever Feed  
Quick Return  
Slotted Table  
Ball - Bearings where they count, on the high speed spindle, **not** on the slowly rotating feed mechanism.

No Lock-Nuts to take the thrust - Buffalo 1907 Drills are free from these by-gones.

Pin Clutch; Nut Closing Devices avoided.

Combination Lock - Nut, Ball - Bearing & Pin Clutch. Bearings **bored** and **reamed** in solid metal, no liners used.

Buffalo Ball Bearing Drill No. 105.

# MORGAN & WRIGHT PADS

**Offer their  
Services to  
Any Shoer Who  
Believes that  
Good Pads  
Help to  
Build up a  
Good Business.**

No one knows better than  
does the shoer that a  
first-class way to kill the  
pad business is to  
use second-class pads---  
pads that are not scientifically made  
and that do not give the  
wear that good pads both  
should and do.

It's next to impossible to find a shoer who has begun the use of  
Morgan & Wright Pads who has not made a specialty of them  
afterwards.

Easy to fit.  
Run larger than other brands.  
A pad for every purpose---15 in all.  
Try them.

**MORGAN & WRIGHT, Chicago.**



**GIANT GRIP**  
Horseshoes and Calks.

A Practical Shoe and Removable Calk for the Wide Awake Horse-shoer.

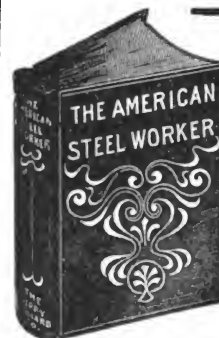
NO Threads to Work. No Tools to Buy.

HANDLED by the **LEADING JOBBERS.**

Write for Price List.

Giant Grip Shoes and Calks are drop-forged from the best material obtainable, and satisfaction is guaranteed if the goods are properly used.

**GIANT GRIP HORSESHOE CO.,**  
Factory and General Office, LITTLE FALLS, MINN.



## "BEST BOOK I EVER SAW"

Writes a blacksmith. Lots of others say so, too. Markham has been hardening steel for 27 years and studying it all the time. He tells in plain English just how to handle each case. Shows the best methods; but if you can't get them, it tells you how to do good work with what you have.

You can build a first class furnace if you want to from his plans and use any fuel you like.

Don't think you've got this information in other books—you haven't. It isn't there. Other books may read nicely and sound well, but none of the authors has had Markham's experience, and that's what counts.

343 pages, \$2.50.

Money back if not satisfied, or sent on approval.

**AMERICAN BLACKSMITH COMPANY,**  
P. O. Drawer 974. **BUFFALO, N. Y.**



**Reinforced**

PATENT APPLIED FOR

**DIAMOND**

**Welds**

USED ON ALL OUR POLES AND SHAFTS.

**THE PIONEER POLE & SHAFT CO.**

**PIQUA, OHIO.**

SEND FOR POLE AND SHAFT CATALOGUE AND PRICES.

E. E. HARRIS, CH. EN. O.

## **ECCLES BALL-BEARING COUPLINGS**

**WITH LEATHER BUSHINGS**

We make these Couplings in Buggy and Surrey sizes, and with Extension for Welding on an Axle Step.

Note how the Spring is fastened at the front end by a pivot, so that it can be **TURNED FORWARD** out of the way, while clipping the Coupling on the Axle.



PATENTED NOV. 25, 1902.

We make Wide Center Clips, both 5-16 and 3-8, and Square Clips for use with these Couplings, also Solid Forged Step Shank Clips.

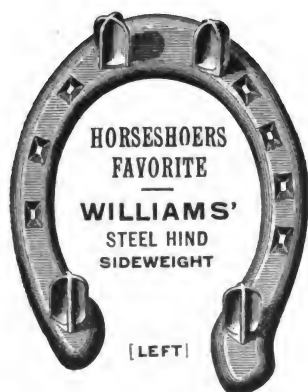
The ease with which our Couplings are put on will save you money.

WE ARE MANUFACTURERS OF A FULL LINE OF  
**CARRIAGE AND WAGON FORGINGS**

**RICHARD ECCLES CO.**

**Auburn, N. Y.**

Sole distributing agents for Cant Slip Removable Horse Shoe Calks.



# BITTENBENDER & CO.

Supplies for  
WAGONMAKERS,  
BLACKSMITHS,  
CONTRACTORS,  
MACHINISTS,  
MINE & MILL,  
RAILROAD.

## IRON AND STEEL HEAVY HARDWARE

126, 128, 130, 132 Franklin Ave.

Scranton, Pa., July 19, 1906.

### To the Blacksmith:

We have arranged with the Williams Drop Forging Co. to distribute their entire line of removable Calks and Shoes, (known as the Cant Slip line) for the season of 1906-7, and as there are some new additions to the line we deem it advisable to make you acquainted with the changes and conditions as early in the season as is possible. They will manufacture for this season a light steel shoe, reinforced at the point where the Calk enters the shoe, and so strengthened that we are confident it will be a complete success. The hind shoe will be side weighted. We had hesitated about advising its manufacture, until Mr. Williams devised the plan of reinforcement, which will avoid the old trouble with the light steel shoe—that of breaking off at the point where the Calks enter it. We have succeeded in getting a higher carbon steel in the center of our "B" Calks for this season, and this together with the improved method of manufacturing, adding as it will to the perfect symmetry of their form, will make them as near perfect as it is possible to get this character of Calk.

We will place these Calks with nearly all of the leading blacksmith supply houses throughout the United States, from whom we would be pleased to have you purchase your supply, but if you find they are not being carried in stock in your territory, we will be pleased to supply you with them direct from the factory. We have said that this is a great era of advancement in American manufacturing, and as you know the movement forward has been rapid and certain. We understand that we have been accused of imitating others, but are inclined to think that it will be rather difficult for the parties making this statement to reconcile it with the fact that the Cant Slip goods are all made by entirely and absolutely new methods, which are known to the Williams Drop Forging Co. alone. We are not imitators, to which fact the character of our goods will testify. If we were imitators it would not be necessary for others to publish that fact, our goods would do it for them. It occurs to us that they, also, are becoming convinced that we are the leaders, and this being true, we are more inclined to favor the accuracy of their judgment than their statement.

Our Calks do not require any mark of their distinction other than their intrinsic merit to recommend them, and you will, therefore, be permitted to save in your purchases the expense of painting.

Yours very truly,

**BITTENBENDER & CO.**  
SOLE DISTRIBUTORS.



A  
Cant Slip



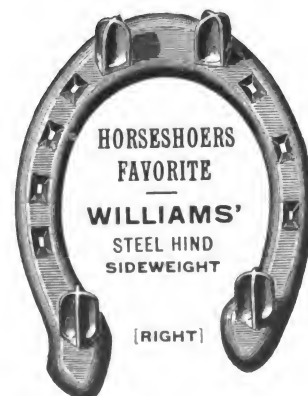
B  
Steel Center



C  
Solid Steel



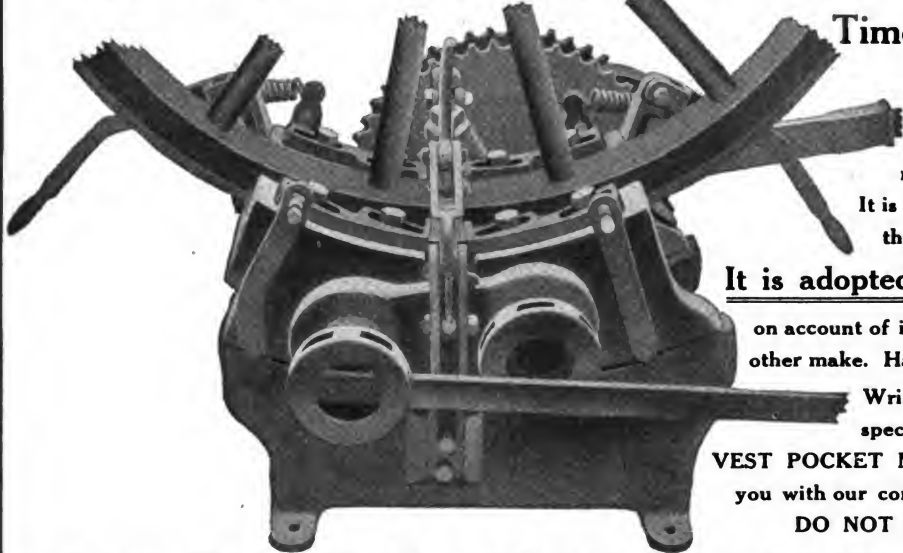
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# YOU ARE THE MAN

Who would be setting the hundreds of tires that others are setting in your locality every year, if you had a **BROOKS**. It gets the business. It sets all sizes of tires by compressing the metal cold. It does the work in from two to five minutes. It is the only machine that has an automatic device for gripping the tires so that the keys will not slip. The **BROOKS** is the easiest operated, the strongest in construction, the most durable and compact Cold Tire Setter built.



## Time and Experience Must Precede Perfection

The **BROOKS** is built by the oldest manufacturers of edge grip machines. It is the superior of all others and receives the highest awards wherever shown.

## It is adopted by the Government Shops

on account of its demonstrated superiority over every other make. Has no equal for rapid and accurate work.

Write us for **DESCRIPTIVE BOOKLET**, special terms and free trial, and a handy **VEST POCKET MEMORANDUM BOOK** will be sent you with our compliments.

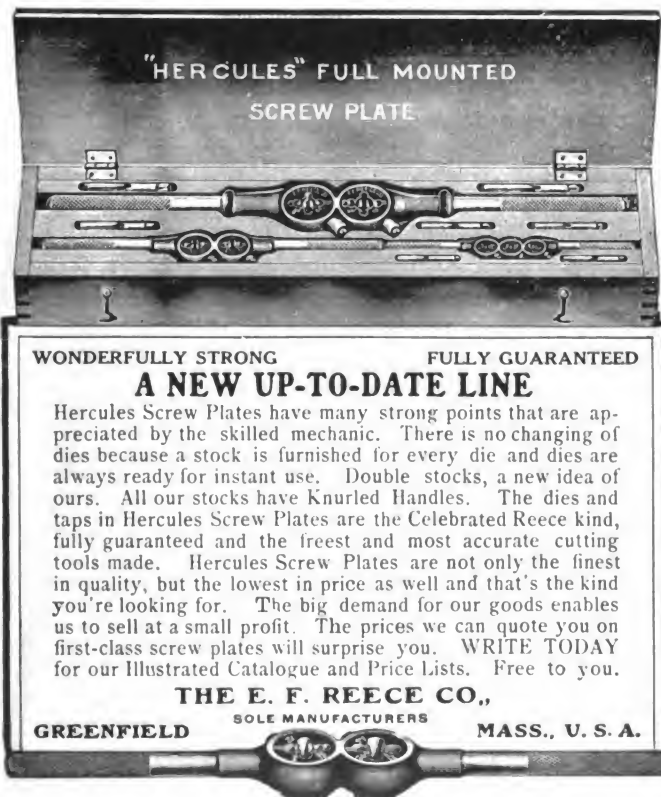
**DO NOT DELAY—WRITE TODAY.**

# THE BROOKS TIRE MACHINE COMPANY

121 North Water Street,

WICHITA, KANSAS.

## REECE HERCULES FULL MOUNTED SCREW PLATES



### WONDERFULLY STRONG FULLY GUARANTEED A NEW UP-TO-DATE LINE

Hercules Screw Plates have many strong points that are appreciated by the skilled mechanic. There is no changing of dies because a stock is furnished for every die and dies are always ready for instant use. Double stocks, a new idea of ours. All our stocks have Knurled Handles. The dies and taps in Hercules Screw Plates are the Celebrated Reece kind, fully guaranteed and the freest and most accurate cutting tools made. Hercules Screw Plates are not only the finest in quality, but the lowest in price as well and that's the kind you're looking for. The big demand for our goods enables us to sell at a small profit. The prices we can quote you on first-class screw plates will surprise you. **WRITE TODAY** for our Illustrated Catalogue and Price Lists. Free to you.

**THE E. F. REECE CO.,**

SOLE MANUFACTURERS

GREENFIELD

MASS., U. S. A.

# Little Giant

COMBINED

## Punch and Shear.

*The Most Powerful Lever Punch and Shear Made.*

5 Punches and Dies with Each Machine.

MADE IN THREE SIZES.

No. 1—Will punch  $\frac{3}{8}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{3}{8}$ -inch thick and 1-inch round. Weight, 515 lbs.

No. 2—Will punch  $\frac{1}{2}$ -inch hole in  $\frac{1}{2}$ -inch iron. Cuts iron  $\frac{1}{2}$ -inch thick and  $\frac{7}{8}$ -inch round. Weight, 350 lbs.

No. 3—Will punch  $\frac{3}{4}$ -inch hole in  $\frac{3}{4}$ -inch iron. Cuts iron  $\frac{3}{4}$ -inch thick and  $\frac{3}{4}$ -inch round. Weight, 250 lbs.

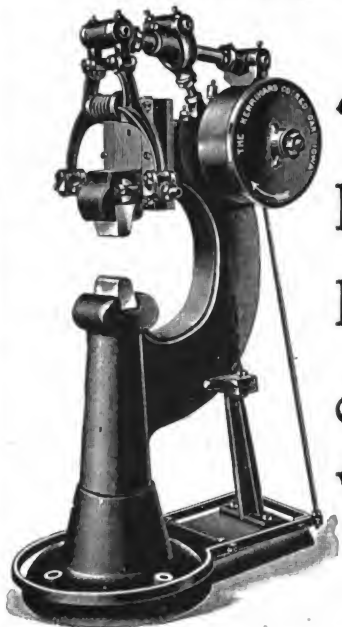
Only ONE operation of the Lever does the work. No changing required.

Note the Improved Stripper and Hold-down. This machine is made for the blacksmith shop, and we DO claim that it is decidedly the best on the market for that place.



For Sale by your Jobber. If not, Write Us. Send for Circular.

**Little Giant Punch & Shear Co., Sparta, Ill.**



"Let the  
Kerrihard  
Hammer  
do Your  
Work."

### The Right Tool at the Right Price

There is a rigid test and a thorough inspection of every part and feature of the Kerrihard Hammer, whereby every possible weak spot is found in the factory and not in your shop.

This practice covers every step from the design and selection of the raw material to the finished product and begets a hammer that is right and stays right.

In it is embodied every modern feature that has proven worthy of adoption and our facilities enables us to present a hammer at a price far below anything approaching it in quality.

An origin, a record and an appearance which sells it almost on sight, a consistent "making good" of every promise quadrupled our sales over last year. We wouldn't mind telling you here just how many we sold only you'd think we were joking. If you want to know what a Kerrihard hammer will cost you, address

**THE KERRIHARD CO.,**

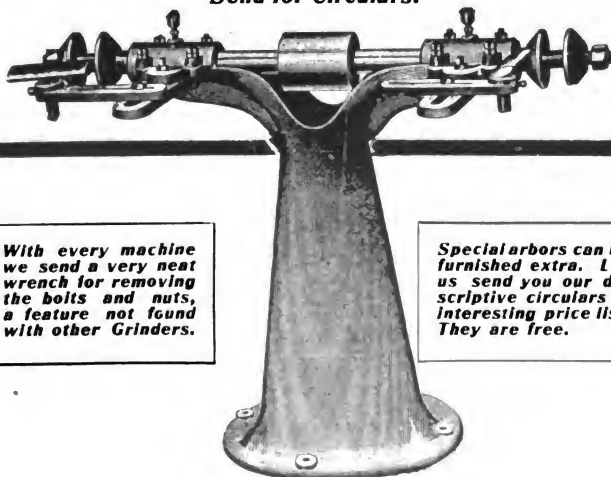
HAMMER AND GRINDER DEPT.,

RED OAK, IOWA, U. S. A.

### OUR NEW EMERY GRINDER

is Especially designed for the Blacksmith Trade. Will Carry Wheels 20 in. in diam., 3 in. thick or smaller with  $\frac{1}{4}$  hole. Price most Reasonable.

Send for Circulars.



With every machine we send a very neat wrench for removing the bolts and nuts, a feature not found with other Grinders.

Special arbors can be furnished extra. Let us send you our descriptive circulars & interesting price list. They are free.

## The Bradley

Ball Bearing

**Shaft Coupling  
Automatically  
Takes Up the Wear**

**T**HE point is, you want a noiseless, quick-shifting Coupling that will stand the test of time. The BRADLEY does this. In the BRADLEY the shaft eye is surrounded by a packing of hard oak leather, compressed and moulded into shape and thoroughly saturated with tallow. This packing is the only part of the BRADLEY that wears.

**B**UT in the BRADLEY SHAFT COUPLING there is also a SPRING, of crucible steel, oil tem-



"The spring does it."

pered and tested. The spring automatically takes up the wear on the leather packing.

**T**HE spring's the thing that does the business. Its pressure is constant and uniform—just sufficient to hold the coupling, with its leather packing, securely in place, and TAKE UP THE WEAR. The BRADLEY is the ONE and ONLY SHAFT COUPLING that takes up its own wear.

**C. C. BRADLEY & SON**  
SYRACUSE, N. Y.

Don't forget that we make Bradley Ball Bearing Couplings.

# THE OLD OLD STORY

Painted by RICHARD VAN FLEET

An extremely beautiful water-color painting valued at \$1,000 and reproduced most artistically in ten colors as an extremely appropriate art-calendar subject



The American Blacksmith controls the use of this beautiful painting until 1908, when art stores will be allowed to sell copies of it at 50 cents each.

But while we control the supply every reader of the American Blacksmith, whose subscription is paid to or beyond January 1907 will be presented with a copy of this beautiful painting in the shape of a most artistic calendar 11¼ by 14¼ inches in size. If your subscription expires before January, make sure of getting one by renewing now.

For those readers who desire a supply of calendars to advertise their own business, we have secured a few extra ones and offer them in small lots at a price that just covers our expenses. The calendars will bear no advertising except your business card. This we will either print on your calendars or will furnish you with a three-line rubber stamp and an inking pad without extra charge. You can then stamp your name on your calendars and also use the stamp for other purposes.

## An Artistic Calendar is the Best and Cheapest Way of Advertising Any Business

These calendars are offered to SUBSCRIBERS OF THE AMERICAN BLACKSMITH ONLY and to induce readers whose subscriptions expire before January to renew promptly and to take advantage of one of the following liberal offers:

- |     |   |        |
|-----|---|--------|
| (1) | 50 Calendars post paid (for subscribers only) | \$2.25 |
| (2) | " " and one year's subscription               | 3.00   |
| (3) | " " " two " "                                 | 3.50   |
| (4) | " " " four " "                                | 4.00   |

Prices include postage or express charges. But you will need to **SPEAK NOW**. The supply is limited and some are sure to be disappointed. If you want a supply reserved for you, order today—a postal will do. Payment can be made later.

## American Blacksmith Company

P. O. Box 974

BUFFALO, N. Y.



No. 8 REGULAR HEAD.—Exact size.

**"BRIGHTON" HORSE NAILS**

The letter "B" appears on the head of each nail.



No. 8 CITY HEAD.—Exact size.

The **EQUAL** of ANY Nail except  
**"NEW STANDARD."****DEALERS' NET PRICES TO SHOERS.**

No.....	5	6	7	8	9	10	11	12
Box....	\$3.25	3.00	2.85	2.75	2.70	2.65	2.65	2.65
Lb.....	.13	.12	.11½	.11	.11	.11	.11	.11

FOR SALE BY ALL DEALERS.

**TRY A FEW OF THEM**

and be convinced of above statement.

Manufactured by

**STANDARD HORSE NAIL CO., New Brighton, Pa.****Your Hack Saw Troubles**

will come to an end if you get the old reliable Universal brand. Send for our free booklet with hints on the use of the hack saw.



**West Haven Manufacturing Co.**  
NEW HAVEN, CONN.

**Electric Forge Blowers  
Excel All Others**

A Good  
Blower  
That  
Blows  
Every-  
body  
Good.



Write  
for  
Prices  
and  
Circulars

MODERN MACHINERY  
MAKES THE SMITH'S  
WORKLIGHTER

**ROTH BROS. & CO.**

27-29 So. Clinton Street,  
CHICAGO, ILL.

**NATIONAL SELF-OILING STEEL TUBULAR AXLES**

Now made  
of high  
carbon steel.



Guaranteed to be stronger and more rigid than solid steel axles. We make both. Write us

**National Tubular Axle Co., EMISVILLE, PA.****SUPERIOR FIFTH WHEELS**

All weights  
and  
diameters  
from  
6 to 60 inches.

Ask your Dealer  
for our line.

If he can't supply you write us.

**MILLERSBURG FIFTH WHEEL CO.,**  
MILLERSBURG, PA.

ESTABLISHED 1836

**BEALS & CO.**

*Iron, Steel  
and Hardware*

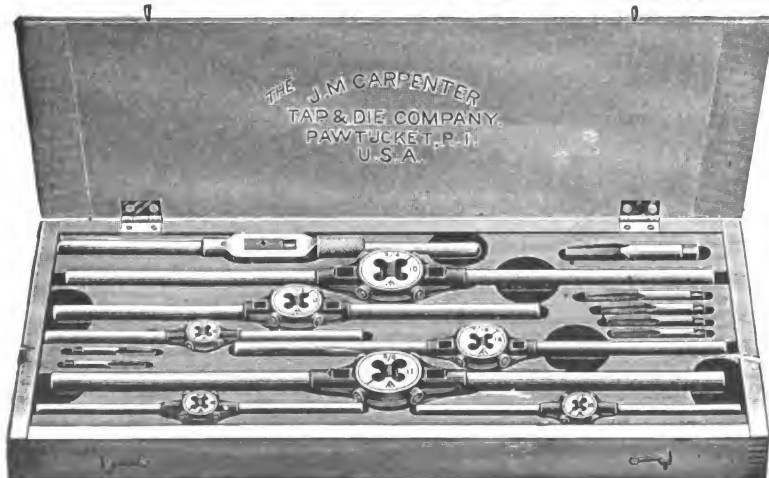
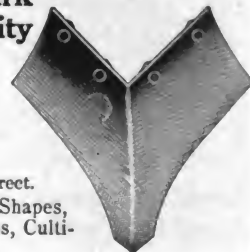
**Tools and Supplies for Horseshoers  
and General Blacksmiths  
Carriage Hardware and Woodwork**

44, 46, 48, & 50 Terrace, BUFFALO, N. Y.

**"CRESCENT" The Mark of Quality****Insist on the "Crescent"**

brand and if your jobber cannot supply you write us direct.

We manufacture a full line of High Grade Agricultural Steel Shapes, Fitted and Bolted Plow and Lister Shares, Merchant Plow Shares, Cultivator Blades, Subsoiler Blades, Landsides, etc., etc.

**WRITE FOR CATALOGUE.****CRESCENT FORGE & SHOVEL CO., Havana, Ill., U. S. A.****CARPENTER'S NEW  
FULL MOUNTED DIE SETS**

With a stock for each die and the Original Nichols Tap Wrench.

Before buying a die set you should see **Carpenter's** and you will have no other make.

Send for catalogue

**The J. M. Carpenter Tap & Die Co.**

Pawtucket, R. I., U. S. A.



## SAVE The Dealer's Profits

### BUY WHEELS DIRECT FROM THE FACTORY

We can save you money on all sizes of wheels; in the white, painted any color and with steel or rubber tires. We bore wheels for boxes without extra charge. Give us a trial order and we will make you one of our many satisfied customers. Write for special prices to *American Blacksmith* readers.

**Carriage Wheel Supply Co.**  
UNION CITY, IND.



**NORTHWESTERN  
HORSE NAILS**  
PATENTED  
CHICAGO

FOR  
STRENGTH  
SAFETY  
AND  
QUALITY OF MATERIAL.

## Northwestern Horse Nails

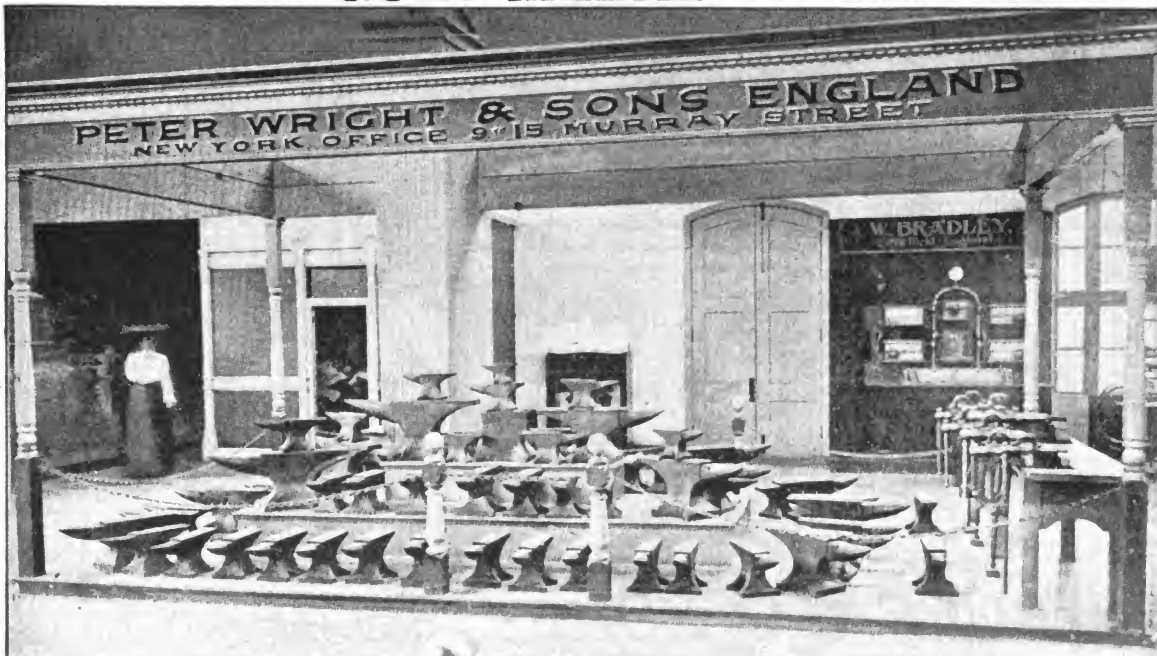
**ARE THE BEST ALL AROUND**

The most perfect in form and finish. Made of the best Swedish Iron. Will hold a shoe longer than any other nail made. Note the re-enforced point—makes it easiest to drive and the safest to use.

**UNION HORSE NAIL CO., CHICAGO, ILL.**

## PETER WRIGHT AND SONS ANVILS

RANK ABOVE ALL OTHERS. AT THE LOUISIANA PURCHASE EXPOSITION THEY WERE  
AWARDED A "**GOLD MEDAL**" ON THEIR MERITS

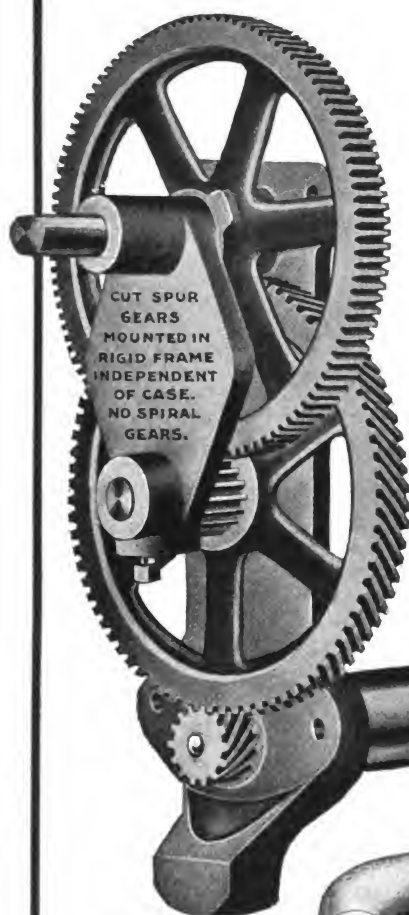


OUR EXHIBIT AT ST. LOUIS, UPON WHICH WAS BESTOWED HIGHEST AWARDS BY THE EXPOSITION JURY  
**WIEBUSCH & HILGER, Ltd., 9-15 Murray Street, New York City.**

# Buffalo 200 Blower

## Our Gilt Edge Guarantee

*In this Blower we offer you the guarantees given with all other blowers in the world. In addition we will replace, free of charge, any parts of Buffalo No. 200 Blower wearing out in five years. Can you buy any other blower with such a guarantee?*



Gearing Used on Buffalo Nos. 200 and 201 Blowers.

Canadian friends: Save duty, buy of The Canadian Buffalo Forge Company, Montreal, Quebec.



Buffalo No. 200 Blower and new H. H. Tuiere which now goes with every machine. Crank turns in direction of arrow.



Buffalo No. 201 Blower furnished with H. H. Tuiere.

**Gears**—Heavy, with large, strong, machine-cut teeth and finished on special machinery, cut spur and helical variety which reduces friction to the greatest possible minimum. Gears are enclosed in a cast-iron, dust-proof casing.

**Bearings**—Bored from solid castings and reamed to gauge, ensuring perfect alignment and smooth easy running.

**Oiling**—Gears run in oil which constantly keeps the working parts perfectly lubricated.

**Blast**—We positively guarantee the Buffalo No. 200 Blower to produce a stronger, more powerful blast, with the same number of turns of crank, and with less effort, than any other blower in the world.

The Buffalo No. 201 Blower is identical in every respect with the No. 200 except the form of fan casing. The crank turns either way but blower does not deliver quite as much air as the standard scroll fan casing used on No. 200 Blower.

YOUR DEALER will place a BUFFALO NO. 200 BLOWER in your shop for free trial to demonstrate its superior qualities.

*Copy of our Latest illustrated Catalogue sent on request.*

# BUFFALO FORGE COMPANY,

BUFFALO, N. Y., U. S. A.

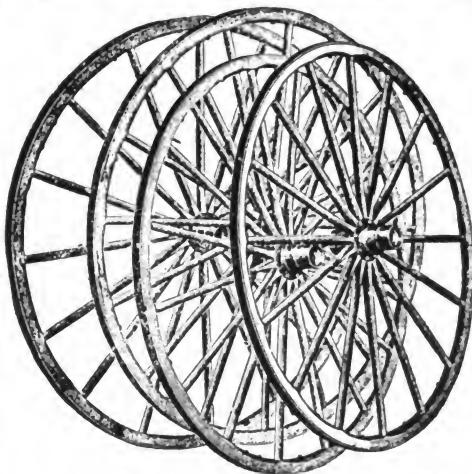


# HAYSLER IRON CO., Kansas City, Mo.

**Cheapest Blacksmith's Supply House in the United States.**

This is another page out of our No. 63 Catalogue, which contains 250 pages of Bargains like these. This big book will be sent to any Blacksmith, Wagon Maker, Machinist or Dealer in the United States. Free for the asking. Write for it today.

Sarven Patent Spokes—D Grade.		Sarven Patent Spokes—C Grade.		Sarven Patent Spokes—B Grade.	
A cheap spoke for very cheap repair work. We carry only the following sizes in stock. These spokes come packed 64 spokes (1 set) in a bundle, and we do not break bundles.		A good spoke for repair work.		A fine white spoke for fine repair work or new work.	
1 inch, per set (64 spokes).....	\$1.45	¾ inch, each.....	\$.04	¾ inch, each.....	\$.05
1 ¼ inch, " 64 ".....	1.45	1 inch, ".....	.04	1 inch, ".....	.05
1 ½ inch, " 64 ".....	1.45	1 ¼ inch, ".....	.04	1 ¼ inch, ".....	.05
1 ¾ inch, " 64 ".....	1.45	1 ½ inch, ".....	.04	1 ½ inch, ".....	.05
2 inch, " 64 ".....	1.45	1 ¾ inch, ".....	.04	1 ¾ inch, ".....	.05 ½
When 5 or more sets are ordered at one time deduct 5c per set.		2 inch, ".....	.04	2 inch, ".....	.06 ½
No house in the United States carries as complete a line of <b>Blacksmiths' Supplies and Tools</b> as we do. No house in the United States can furnish as good goods for as little money as we can.		When 5 or more sets are ordered at one time deduct 12c per set.		When 5 or more sets are ordered at one time deduct 5 per cent. When 10 sets are ordered at one time deduct 10 per cent.	
		<b>Note</b> —Our grades of Lumber are the best we can buy and we ship out nothing but first-class stock.			



## SARVEN PATENT WHEELS WITH OR WITHOUT TIRES.

Look at these prices on Wheels and you will readily see we are the leaders in the Wheel Business. We do not hesitate to say our wheels are the best wheels for the money, quality and workmanship considered, sold by any one. The hubs are second growth elm, spokes and rims of strictly Ohio hickory. All our wheels are made by a firm whose reputation for honest wheels is second to none in this country. Every wheel is carefully inspected before leaving the factory and if found imperfect in any way is rejected; the same care is taken when the wheels are received by us. They are made with the object of giving value received to the purchaser and are sold on their merits.

**Setting Boxes in Wheels.** When you buy your wheels and axles from us we will set the boxes in the wheels for 75c per set extra. We have a machine for boring out the hubs, so that boxes fit perfectly and, as we do not use wedges, but press the boxes in the hubs with enormous pressure, we guarantee the boxes not to come loose.

**Welding Axles.** When long bed axles are bought from us we can send pattern or sketch of shape of axle bed, at the following prices per set:  
¾ and 1 inch, welding, shaping and setting.....\$2.75  
1 ¼ and 1 ½ inch, welding, shaping and setting.....3.50  
1 ¾ and 2 inch, welding, shaping and setting.....5.00

For 2 wheels we charge one-half the full set price. For one wheel we charge ¼ the full set price with 25c added for breaking set.

### SARVEN PATENT WHEELS WITHOUT TIRES.

SPOKE		HUB (Sarven)		RIM		HEIGHT	PRICE PER SET OF FOUR WHEELS			
No. of Wheel	Size	Diam.	Length	Tread	Depth		A	B	C	D
01	1 ½	21 ½	6 ½	¾	1 ½	3 to 4 ft.	\$ 9.38	\$ 7.38	\$ 5.63	\$ 4.38
1	1 ½	21 ½	6 ½	¾	1 ½	3 to 4 ft.	9.63	7.63	5.88	4.63
3	1 ½	3 ¾	6 ½	1	1 ½	3 to 4 ft.	9.75	7.75	6.00	4.75
9	1 ½	3 ¾	7 and 7 ½	1 ½	1 ½	3 to 4 ft.	11.00	8.50	6.75	5.50
13	1 ½	3 ¾	7 and 7 ½	1 ½	1 ½	3 to 4 ft.	12.50	10.00	8.00	6.50
17	1 ½	4 ¾	8	1 ½	1 ½	3 to 4 ft.	18.36	15.93	12.96	10.26
21	1 ½	4 ¾	8	1 ½	1 ½	3 to 4 ft.	19.44	16.74	14.04	10.80
25	1 ½	4 ¾	8 ½	1 ½	1 ½	3 to 4 ft.	21.50	18.90	15.66	12.15
33	1 ½	5	9	1 ½	1 ½	3 to 4 ft.	22.68	19.98	16.74	12.96

We carry Tired Wheels, 3 feet, 3 feet 2 inches, 3 feet 4 inches, 3 feet 6 inches, 3 feet 8 inches and 4 feet high. There should be 4 inches difference between front and hind wheels.

For example, 3 feet 4 inches and 3 feet 8 inches correspond; 3 feet 6 inches and 3 feet 10 inches, 3 feet 8 inches and 4 feet.

#### IMPORTANT!

We carry all kinds of Wagon Stock, both for narrow track and wide track wagons. Narrow track is 4 ft. 8 in., wide track is 5 ft. 2 in. from outside to outside of tires. Where no track is mentioned on order, we **always send Narrow track.** Be sure and state which track is wanted.

## Sarven Patent Wheels WITH ROUND EDGE STEEL TIRES.

No.	Size of Spoke at Hub	Length of Hub where Box goes in	Width of Rim	Size of Tire	Weight per Set of 4 Wheels	Price per Set of 4 Wheels D Grade	Price per Set of 4 Wheels C Grade	Price per Set of 4 Wheels B Grade
1	1 ½	6 ½	1 ½	1 ½	90	\$ 6.66	\$ 7.91	\$ 9.66
3	1 ½	6 ½	1 ½	1 ½	100	6.96	8.16	9.91
9	1 ½	7 ½	1 ½	1 ½	125	8.47	9.72	11.47
13	1 ½	7 ½	1 ½	1 ½	150	9.91	11.41	13.41
17	1 ½	8	1 ½	1 ½	200	15.12	17.82	20.79
21	1 ½	8	1 ½	1 ½	250	18.36	21.60	24.30

When you buy 5 sets of wheels at one time from us, we bore hubs ready for boxen for 25 cents per set extra. When you buy 10 sets of wheels at one time from us, we bore hubs ready for boxen FREE. Send for our 250 page No. 63 Catalogue Free. SEND FOR IT TODAY.

# HAYSLER IRON CO., KANSAS CITY, MO.

**Cheapest Blacksmith's Supply House in the United States.**

CORRUGATED PATTERN.

**In Fly Time, When the Stamping Horse Puts His Shoeing to the Test, "The Capewell" Horse Nail Stands the Strain Successfully. It is the Strongest and by far the Best Nail in the World.**

"Capewell Nails hold the shoe better than any other nail we have ever used. On account of their superior strength we can use a much smaller size of nail, thus keeping the hoof in the soundest and best possible condition. We consider them the best nail on the market."

ANHEUSER-BUSCH BREWING ASSOCIATION,  
OF ST. LOUIS.

**A Nail that Holds the Shoe Holds the Customer.**

Made by **The Capewell Horse Nail Company**  
**HARTFORD, CONN.**

The Largest Manufacturers of Horse Shoe Nails in the World.

BRANCHES

New York: . . . 103 Beekman St.  
Philadelphia: . . . 323 Arch St.  
Baltimore: . . . 6 East German St.  
Buffalo: . . . . . 11 Ellicott St.  
Cincinnati: . . . . . 720 Main St.  
Detroit: . . . . . 29-31 Farrar St.  
Mexico City: . . . Apartado, 2377

Chicago: . . . 238-240 Randolph St.  
St. Louis: . . . 12-14 North 12th St.  
New Orleans: . . . 736 Union St.  
Denver: . . . . . 1611 Blake St.  
San Francisco: Santa Fe Warehouse, Spear St.  
Portland: . . 554 Worcester Block.  
Toronto, Canada: . 50-56 Duke St.

Catalogue Free upon Application.

PLATE PATTERN.



# EARTHQUAKES IN CHILE

DO NOT AFFECT THE CALK MARKET IN THE U. S.



After the most exhaustive tests at the Army Posts the

**GOVERNMENT**

decided that the

**ALWAYS SHARP  
CALK**

is the most practical and reliable of any removable calk made. All other so-called sharp calks were rejected. The demand for the coming season has been so great that we ask all in the "Snow Belt," who have not done so, to **PLACE THEIR ORDERS NOW**



**Samples, Testimonials and an Elegant  
Souvenir Booklet sent on application**

The "ALWAYS SHARP CALKS" are made of the finest carbon steel, are case-hardened and have interchangeable thread with other calks. A recessed shoulder prevents working loose when once adjusted in the shoe. There is no other calk made as serviceable as the **ALWAYS SHARP CALK**—this is privately conceded by other makers.

**ALWAYS SHARP CALK COMPANY**  
**JERSEY CITY, NEW JERSEY**

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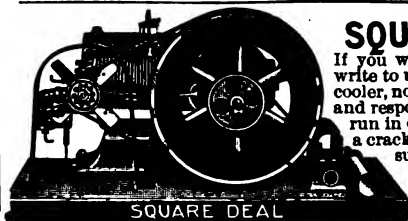
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## HONEST DEALINGS.

Before an advertisement is accepted for this Journal, inquiry is made concerning the standing of the house signing it. Our readers are our friends and their interests will be protected. As a constant example of our good faith in American Blacksmith advertisers, we will make good to subscribers loss sustained from any who prove to be deliberate swindlers. We must be notified within a month of the transaction giving rise to the complaint. This does not mean that we will concern ourselves with the settlement of petty misunderstandings between subscribers and advertisers, nor will we be responsible for losses of honorable bankrupts.

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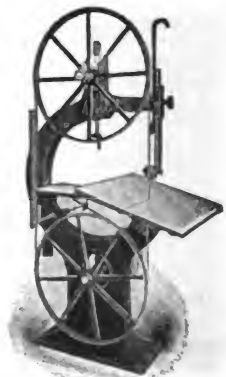
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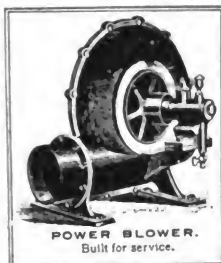
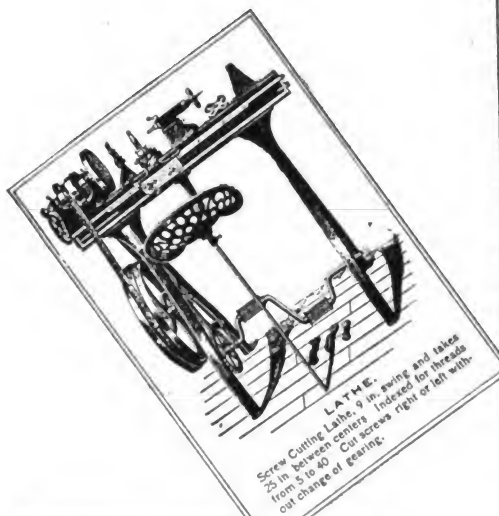
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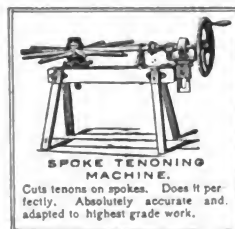
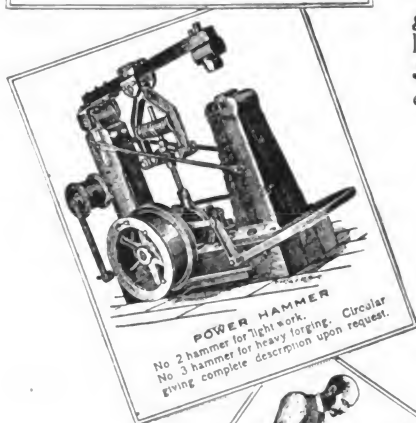
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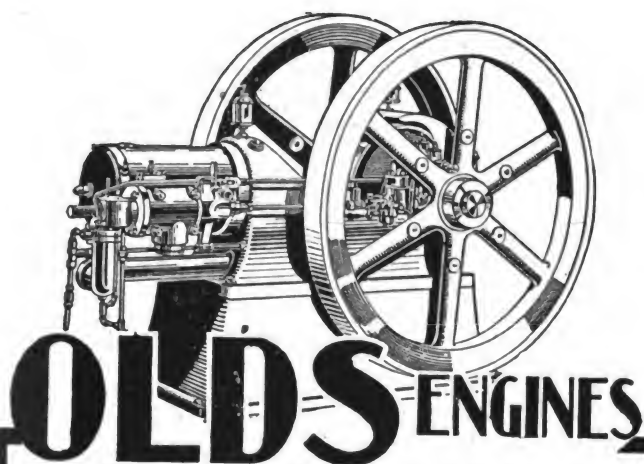
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# THE AMERICAN BLACKSMITH

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## Cater to Quality Patronage.

How many smiths fully realize the value of a patronage of quality—trade that is exacting—customers who want the best? It means for the smith a higher grade of work, better prices, more profit and last but by no means least—better and surer pay. It's every bit as easy, if not easier, to put out high grade, first class work as it is to turn out cheap work. Your conscience doesn't suffer nearly as much and you can look your customer straight in the eye when you say: "That machine is now as good as new."

Of course, you naturally require a little more money for best work, but people, knowing the quality of your work will gladly pay what it is worth. This extra price for better work should also make the profit correspondingly higher and what further argument in favor of goods of quality need be advanced. The skilled mechanic, the man able to produce first class work, should switch his customers to the quality track. Make your repairs last a bit longer than the other fellows. If it is painting, see that the job is done right and insure its lasting qualities. In

short, put your best efforts into every job you undertake.

As a rule, the customer who desires the best of work, materials and supplies is also well able to pay the price asked. The server of quality patronage therefore runs less risks of loss by way of bad accounts than he who caters to a class of trade whose main and only thought is price. There are, of course, certain occasions for cheap jobs and hurry work and it is not implied that work of quality should be taken up to the exclusion of this class. But endeavor as much as possible to get your customers to think of quality in connection with your work and put quality into it—it is well worth the endeavor and means larger profits.

## The Manufacturer and the Jobber.

A number of articles have recently appeared in our columns, relative to the unfair business methods of certain catalogue houses—those concerns who sell supplies to the smith's customers at wholesale rates thus cutting the smith out of trade that rightly belongs to him. A case very similar to this, but affecting the smith as the consumer has recently come to our notice. Briefly stated this case is as follows: The manufacturer of a most important article of smith shop equipment was asked to quote prices. The smith upon receiving the desired information, expressed surprise at not getting a better price than he could get from his jobber and he seemed quite indignant that the manufacturer should have such a business policy. How quickly the color of the horse changes. Of course, the smith didn't consider that the jobber must have the protection of the manufacturer and that while the latter did not refuse to quote prices, such prices were made so as to allow for a reasonable profit to the jobber, from whom the smith was instructed to purchase, and with whom the manufacturer would otherwise have had just such tilts, as the smith is now

having with the unfair catalogue house. Look at this matter in a fair way. Don't insist upon getting a wholesaler's price when you are not entitled to it. Let's have fair play all round.

## A Brief History of the Smithing Art.

The use and production of iron is now generally known to have its origin in pre-historic times. A piece of the metal, said to date back at least 4,000 years, is to be seen at the British Museum and pieces of iron found in various sections of Egypt show that the ancients used weapons, sickles and other tools made of this metal. Excavations at Assyria and Babylon show that these ancient cities also knew the iron worker. Here have been found chains, hammers, knives and even saws of iron. In Palestine and Phoenicia we also find that iron came into early use. Here was Tubal-Cain as "an instructor of every artificer in brass and iron." The Chinese claim that steel was invented 2,000 years B. C., and in Persia, India and Japan we also find evidence of the early knowledge of the industry. That the early Greeks and Romans understood how to work iron is proved by their writings, their vases and the articles made of this metal which have been discovered. As for welding the metal, one Glaucos of Chios is given the credit as the inventor. He lived about 600 years B. C.

These early records also show that the artistic as well as the useful was the objective of the ancient iron-worker. Ornamental vases and embossed statues have been found beside the weapons and agricultural implements. The tools used by these ancient craftsmen are pictured on Grecian vases and represent anvils, hammers and tongs. Even their bellows were, to all purposes, very similar to those in use at the present day.

Further proof of the early existence of the art of iron working is found in the excavations at Pompeii, Herculaneum, Vulca and at Caere. Not only

have iron weapons and utensils been found here, but locks, keys, tripods, braziers, searing-irons and even large chests fashioned from this metal have been brought to light. That rings of iron were worn by the ancients is shown by their custom of using them as an insignia of a free-man, and the fact that iron working was practiced in several parts of the old world long before the Romans started out to conquer it, is shown by the high state of development in which they already found the art.

On reviewing the early history of the smithing art, one is impressed with the fact that the ancients used iron and steel only where there was a probability of no other material well answering the purpose such as simple tools and implements. But for articles of beauty, luxury and ornament, bronze and the precious metals were given preference, and we therefore find the most artistic pieces and the most beautiful effects wrought, not in iron and steel, but in the brilliancy of bronze and brass.

#### A Set of Wrought Iron Andirons and an Artistic Entrance Gate.

The accompanying engravings show a set of very artistic andirons and a very neat entrance gate. Andirons seem to rather fascinate the average artistic iron-worker. Of course, there is an exceptional chance for artistic effects in fashioning "fire-dogs," and some very beautiful iron work in this line has been shown in these pages. Those shown in the accompanying engraving are plain but very artistic. The twisted pieces, crowning each upright, produce a most pleasing effect. The rings made of twisted square stock are also effective and altogether these irons are well worthy of a permanent place before a drawing room fire.

The entrance gate is also very artistic and though plain,

shows what can be done in a combination of scroll and straight bar work. The end of each bar of this grating is twisted and gives to the gate a finished appearance. This gate is hung at the



A PLAIN BUT ARTISTIC ENTRANCE

entrance to one of Buffalo's most beautiful private gardens. The set of andirons were forged by one of the boys at the Illinois State Reformatory.

The examples of ornamental iron work which have been pictured in these columns from time to time must certainly have induced several of our

readers to take up this work for pleasure or profit. Let your brother craftsmen know what you are doing in this line.

#### The Other Side of the Apprentice Question.

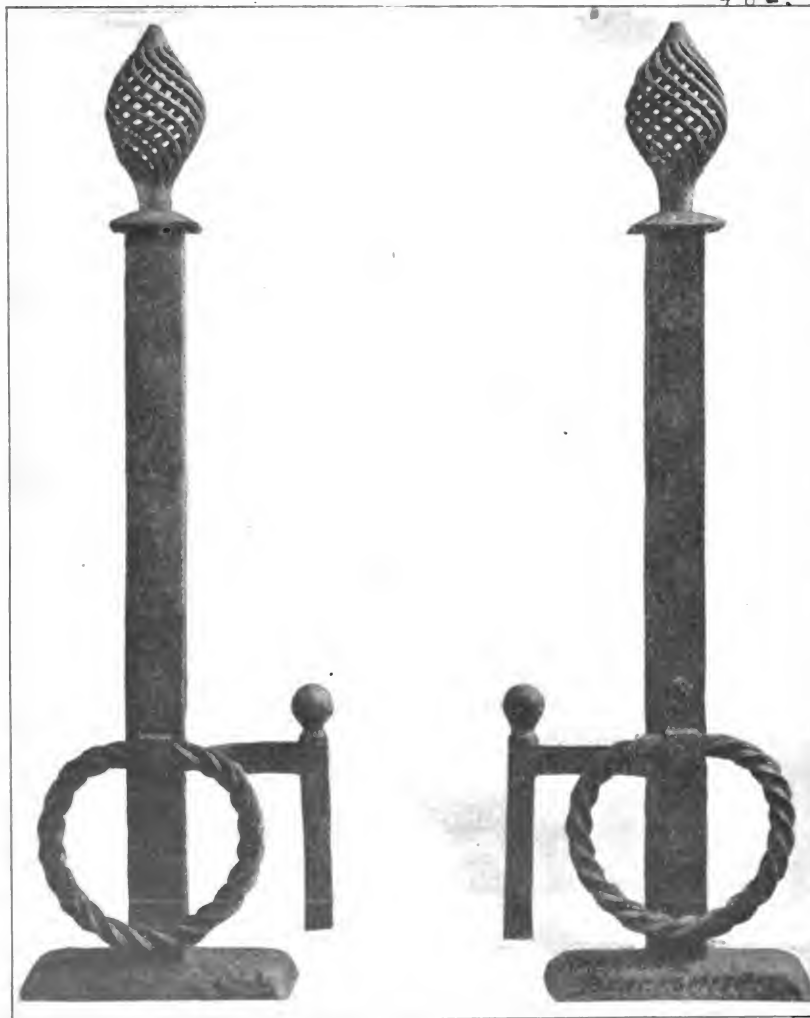
P. J. M.

In your May number of THE AMERICAN BLACKSMITH you asked for the apprentice side of the question on learning trades. I am at present learning my trade and sometimes find it pretty hard to stay with it. If an apprentice doesn't understand the simple parts of the trade when he first starts, his foreman thinks he ought to and gives him a "calling down" right at the start. Then again the foreman will make a bargain with him and every year the bargain changes in favor of the foreman. If the apprentice happens to break a drill or tap he has to pay for it, if the foreman is in a bad humor. Then some customer comes in and complains that the smith has used bad material, but has still charged the top price for it. It makes the foreman

angry of course and he then starts to chew at the apprentice. He talks to him like a slave-driver and some of the masters are no better. Then they say lots of things in a manner that is unbearable. It is not so much what they say as the way they say it. A boy must put in three to four years at from \$2 to \$6 per week and he is allowed to learn very little until the last year. The apprentice side of the problem is by no means all "ice-cream and cake." There's also a little vinegar thrown in.

Spring Hill Stock Farm and William Penn, 2074.

Beautifully situated in the western section of Carroll county is a plot of about six hundred acres of land very appropriately named Spring Hill Stock Farm. The barns and buildings of



ANDIRONS PRESENT UNLIMITED POSSIBILITIES IN ORNAMENTAL WORK



BLACK COLT FOALIED 1905 BY WM. PENN



BAY COLT FOALIED 1904 BY WM. PENN

the farm nestle in a beautiful glen and the surrounding hills produce a most picturesque background to one of the finest trotting horse breeding establishments of the west. The farm gets its name from a spring which bubbles and gushes from the side of one of the hills. This stream of crystal supplies barn and training stable with an abundance of the finest water.

Col. N. W. Bowen, the proprietor of Spring Hill Stock Farm, belongs to that comparatively small group of horsemen known as safe, sound and successful. He established his trotting horse breeding farm some five years ago and has now as fine a collection of "speeders" as can be found in any one stable. His "top-notch-er," William Penn, 2.07½, is well known in trotting horse circles and the performances of this beauty are known by heart to every horseman worthy of the name. This exceptional race stallion together with two of his very promising youngsters are shown in the accompanying engraving. The group of spring foals, yearlings and two-year-olds sired by William Penn at Spring Hill Stock Farm are uniform in size and have plenty of size, finish, conformation, action, disposition and general individual characteristics. All have that alert, snappy action which characterizes the real aristocrat of

the race world. Col. Bowen may well be proud of his extreme speed sire and the fact that William Penn was selected to head the stud at Spring Hill Stock Farm argues well for the present and future products of Col. Bowen's trotting horse breeding establishment.

#### Creating Smith-Shop Business.

B. JULIUS.

The smithing firm of Carlton and Stubbs is favorably known throughout the length and breadth of Bar county, and yet 'tis but three years ago since John Carlton started in to pound iron in the little old shop at the Corners.

It was this way; Carlton was just

told Carlton that he knew what was coming. He likewise said, "If I can show you that I am worth my wage, will you keep me?" Carlton said, "Yes, if you can show me in one week. If, however, at the end of the week you have cost me more than you bring in, you'll have to go."

The bargain made, Stubbs, the helper, started in to manufacture butcher knives. The shop contained many old vehicle springs, which had passed from owner to owner, and these were the stock used. The handles were fashioned from the small limbs of trees. He therefore used little or nothing that could be used on other work. The next week he packed a valise with butcher knives and called upon the butchers and farmers in his own and the adjoining townships. Those wanting a special knife were told that it would be made for them at a special price. In this manner he continued to manufacture and sell butcher knives until everyone in the neighborhood was supplied or knew where to get one when needed.

In the meantime Stubbs kept both eyes and ears open on his calls and he used his mouth when necessary.

He found by observation that this farmer was badly in need of a set of harness, while that one intended to buy a gas engine. So when the butcher knife



WILLIAM PENN-2.07 1-4

finishing his first year at the Corners, and was about to discharge the helper whom he had hired to assist him during the rush season, when the latter

business showed signs of a slump, he got permission from the boss to write for implements, harness and gas engine catalogues, and finally a very satisfactory agreement was made with the manufacturers of well known brands of farm implements, harnesses and gas engines.

Stubbs now called on the farmers, whom he had observed on his previous travels were in need of farm implements and supplies. Of course he didn't sell to every one he visited, but he told every farmer that Mr. Carlton now carried a first class line of farm implements and that he also did excellent repairing and horseshoeing.

It is almost unnecessary to say that by this time the smith realized the value of his helper and began to operate with him. The shop was fixed up and enlarged, a gas engine installed and several labor-saving machines purchased so that by the beginning of the third year, things began to come to the "smith-shop at the Corners" about as fast as they could be attended to.

Stubbs was now approached with a partnership proposition which he readily accepted. The firm of Carlton and Stubbs now employ eight men in their various departments and anything in the line of vehicle work, general repairing or horseshoeing is done.

### Forging Shoes for Tow Boats.

C. H. RICHARDSON.

The average tow-boat that plies the river and harbors is so proportioned that the stern of the boat draws more water than the bow, or, in other words, the boat sets deeper at this point than anywhere else. It is, therefore, easy to be seen that this part of the boat's keel should be protected fully as much if not more than the bow is at the water line. This we know is protected by the heavy stem iron and also the rope fenders placed a little above the water line. If the keel were not protected at this point every sand-bar that it came in contact with would chafe the keel at this point, so it would be necessary to replace it very often.

To overcome all the difficulty that is likely to happen to this part of the boat, an iron shoe is made to fit on the bottom of the keel. This acts as a rub iron and on this blade six wings or arms are welded. The object of this article is to explain the best method that I have found for welding these arms on the blade or shoe.

The plan used in most shops, when forging a shoe is first to procure the

material the width of the boat's keel and of the desired thickness—the average being about  $1\frac{1}{2}$ -inches to 2 $\frac{1}{2}$ -inches thick. The wings or arms are then forged from stock large enough to shape them. Separate heats are now taken and the arm and sole are worked together. There is no preparation such as up-setting or scarfing done on the sole, but one edge of the bar is heated, keeping the opposite side as cold as possible. The first objection to this plan is the length of the fire that is required to bring up this heat. Take for example the present shoe, which is an ordinary size. This wing is 8 by 2 inches and requires a good fillet to support the arm from being twisted off sideways. About one-half of the width of the wing on each side should be allowed for the fillet, or in other words, the radiations of the fillet should equal one half of the width of the arms. This would make the pieces at least 16 inches long. The fire required would have to be 20 inches long to heat this piece uniform, for every inch of the 16 will have to be welded hot to make a proper job. The second object; there is generally more or less trouble in get-

making tow-boat-shoes: I selected material large enough to hammer the shoe from, leaving it about two inches wider than the finished width across the wings. I prefer the hammered material to the rolled stock on account of its lasting quality in salt water. Now draw the distance between each pair of wings as shown at A B. This piece of work is now laid down. The wings are forged next with a piece, that will work up to the size of the lower end of the wing, in this case 8 by 2 inches, plus enough for a good offset, about  $1\frac{1}{2}$  inches, fuller in as shown by L M at D. Now draw and chamfer as shown at P. If two V-necking fullers are used when making the offset, at M, the result will be a nice square shoulder with the work more than half cut off. This shoulder or offset should be slightly ragged so that when welding the thin edge that is formed on the inside of the shoe it can be easily worked in with a fine fuller. To do this, cool off the back of the wing (that is the chamfered side), and then with a small rod about  $\frac{1}{8}$  of an inch, run lightly over it, working it somewhat as you would a jump for an eye band.

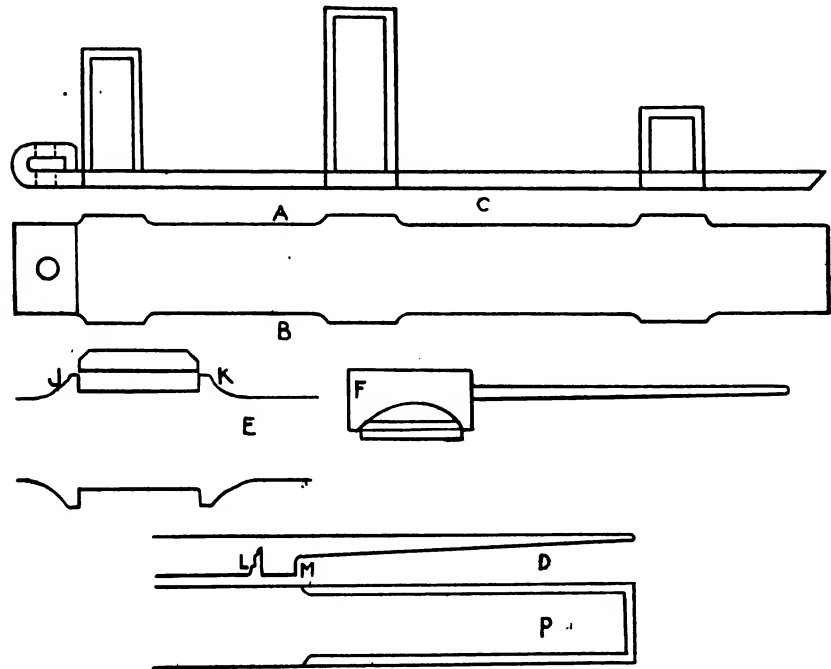


FIG. 1.—PLAN FOR FORGING A TOW-BEAT SHOE

ting them in the right place, there being no guide to speak of, and this slight difficulty causes the loss or delay of the heat. Quite frequently it also requires very careful watching while heating the metal to prevent the thin ends from burning off.

Refer to C in the engraving, which represents the bottom or sole of the shoe. The plan which I have adopted for

Having all the jumps prepared, the next step is to lay out the blade for the arms. Starting with the center pair of wings, lay it out as at D, taking care to leave at least one inch more stock than the required width; in this case, 12 plus 1 or 13 inches. This allowance is for welding and is very readily used up. Now mark the penciled work with a cold chisel and place the work on edge in



the fire, keeping the opposite edge as cold as possible. Now cut out the marked space and fit in the wing loose enough, so it will not stick when it is being driven into place when hot.

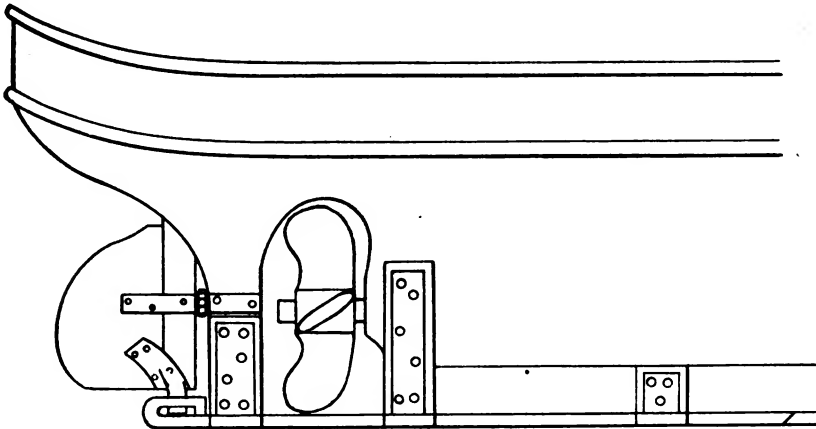


FIG. 2.—THE SHOE PROTECTS THE KEEL OF THE BOAT

Now, taking separate heats, make the arm a little hotter than the sole and drive them well together, working the fillet with a large radius fuller. Also work the inside scarf with a small fuller so as to fill the joint, and last of all, cut off the surplus stock that hangs over the back of the shoe. This amount of work should be easily accomplished in the one heat with two good sledgers. The wing should now be beveled, that is, flared out at the top to match the taper of the keel. All the wings should now be put on as just explained. The forward pair should be the second pair of arms welded in place. These arms are very short in comparison to the other two pairs, the object for having this pair so short is that the boat's keel takes such a sharp shear or bevel, at this point that it is impossible to get straight holes through so the shoe can be bolted on. The after part of the shoe should now be made, leaving the rudder-pin socket till the last.

#### Don't's for the Craft.—5.

##### A Few More for the Horseshoer.

JOHN R. KING.

Don't be in a hurry.

Don't act before you think. Think first.

Don't fail to take THE AMERICAN BLACKSMITH.

Don't use a large nail—it only splits and helps to destroy the foot.

Don't forget that a horseshoer must use his head as well as his hands.

Don't think you know it all but keep your eyes open and learn from all.

Don't try to shoe horses on "system." Different cases need different treatment.

Don't cure (?) shin hitters by cutting

the inside of the feet lower than the outside.

Don't put outside weights on a "pad-dler." The weights should be inside to be effective.

Don't forget that the man who saws wood and says nothing is seldom if ever in trouble.

Don't loose sight of the fact that it's the horseshoers head that must save the horses feet.

Don't talk against your neighbor smith. Get him to take "our" craft paper and I'll guarantee a cure.

Don't "swell up" and think too highly of yourself or of your shoeing. Some one who "really knows" may "take the wind out of your sails."

Don't use "cow-boy" shoes ready fitted which are nearly always too long or too short. Use unfinished shoes and see that they fit before you nail them on.

#### How the Broken Jar was Repaired.

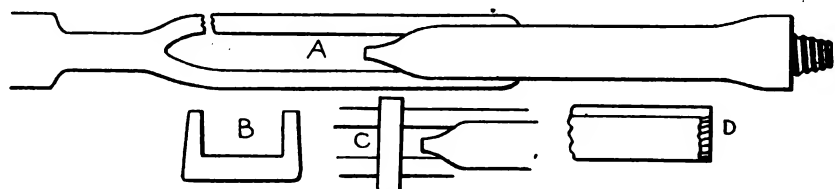
L. R. SWARTZ.

In the July issue one of the readers asked regarding the best method to repair a pair of drilling jars which carry a  $3\frac{1}{2}$ -inch drill bar. It would be best to cut off the unbroken rein of the

reins are now welded at one heat. If the reins are not welded in this manner the welding of the second rein is very liable to throw a strain on the rein which was first welded and this will cause it to break. In all work of this kind the very best fuel available and a good welding compound is necessary.

To keep the reins from springing apart and to protect them from side strains forge a clamp or bridle as shown at B and place it on the reins as at C in the engraving. The jars are now pulled open as far as they will go and a block of hard wood D is fitted into the sound link to fill it up between the tongue of the broken link and the crotch of the sound link; you will now be able to drive the weld into place in the fire, and thus give the heat less chance of dying out before the weld is made. If good material is used and proper care taken, the job will be about as good as new. After welding, allow the metal to cool off, then reheat the repaired link and cool it as slowly as possible to relieve all strains.

There are always two things at work which tend to wreck a pair of drilling jars, viz., strains from welding heats and forging when the jars were made, and crystallization caused by the pounding and side strains to which the jars are subjected when in use. This, of course, also applies to other drilling tools but is most noticeable in jars. And let me say here, that there are jars and jars, of many different patterns, sizes and kinds used. What are known as round link jars are in general use, but we still find the square link varieties made of square stock in operation in many sections, still others use piston jars and a few use the self-turning variety. One man will swing a  $3\frac{1}{2}$  or 4-inch bar and a pair of 5-inch round link jars weighing 200 pounds with a 12 or 15-inch stroke. Another man uses the same size jar with a 4 or 6-inch stroke, or he may



ROUND LINK JARS ARE IN GENERAL USE

jar link as shown in the accompanying engraving and then, of suitable stock, make a stub of sufficient length and size to make both reins match. Now weld the stub to the broken rein and shape up this stub for rewelding. Both

perhaps gather up a pair of fishing jars having an 18 to 24-inch stroke and  $4\frac{1}{4}$  or  $4\frac{1}{2}$ -inch diameter.

Square link jars are more easily made and repaired than the other varieties but they are not as strong nor as

durable for a given diameter. The lower links of jars break oftener than the upper links. If the jars are badly worn the best method for repairing them is to get a new pair or take them apart and reforge them to restore the grain of the metal.

#### A Device for Raising Automobiles.

L. H. DODSON.

Many smiths are now equipping their shops to care for the crippled automobile which is occasionally pushed their way. Most smith shops will not have room for a regular pit for inspecting the under-workings of the car and will find the device here illustrated an excellent substitute. In choosing material for building, nothing but the best should be used, as a breakdown, liable to occur from faulty material or construction, is likely to result in serious injury to the repair man.

The accompanying engraving illustrates the device so clearly that the average smith will be able to construct one with little or no explanation. The platform consists of two good, strong planks A. These rest on two V shaped supports B, which in turn work on hinges C, which are secured to the base board D. The end supports consist of a stationary board E at one end and a hinged leg F at the opposite end. The leg at F is attached to the main plank by means of a heavy hinge. When the machine is in proper position, this leg is turned under the platform and held in position by means of a rod and thumb screw. The stationary support is attached to the plank by means of a

However this will not be necessary if good, stout stock is used. To facilitate running the machine up on the platform, a small wood block is attached to the floor at K. Fig. 1.

To place a machine on the platform, place the device in the position shown in Fig. 1 and run the machine up the incline. After reaching a certain point, the device will come to the second

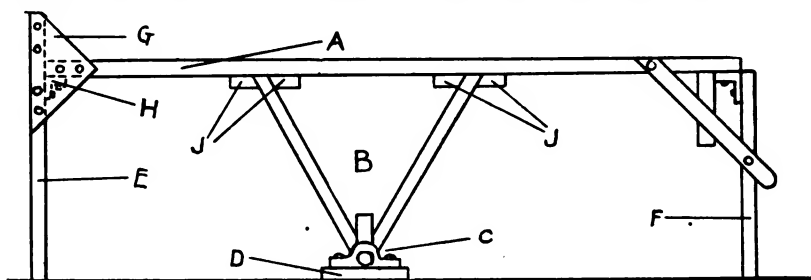


FIG. 2.—AND PRACTICALLY RAISES ITSELF

position when the hinged leg may be swung under the platform and bolted rigidly to support the machine.

#### Another New Kink.

A VILLAGE BLACKSMITH.

A great deal of the machinery of the present day is put together with set screws. After the farmer has "laid by" his corn and harvested his other crops, many plows and machines are left exposed to the weather until the next year. When he begins to adjust them the next year the set screws are rusted in tight and fast. Of course he gets a big wrench and proceeds to twist a few of them off. Then he comes post haste to the blacksmith to get the old ones taken out and replaced with new ones. Our first method was to dot in

which we use with success in nearly every instance. First we take the piece that has the old screw in it and take our hack saw and cut a slot about  $\frac{1}{8}$  of an inch deep into the old screw. Then we lay the piece in the forge fire with the screw down and heat slowly to a dull red. Now take it out and place in the vise. Then take a screw driver and turn the screw out. We have

used this method for several years and it seldom if ever fails.

#### A Simple Furnace for Melting Brass.

R. H. SOMERS.

The furnace illustrated in the accompanying engraving is simply and easily constructed and may be erected by any smith who has need of a furnace of this kind. The smith will find it convenient to place his furnace in a corner of the shop where it will be out of the way when not in use. It may be built to suit practically any requirements, but should the smith desire a furnace of large capacity, he will find it convenient to construct it below the floor level. This will greatly facilitate the handling of the crucible when ready to be withdrawn from the furnace. However, should the charge be such as to allow of its being easily handled, the furnace may be built with the ash-pit on a level with the floor. Having decided on the size of the furnace, it is constructed as follows: A box of sheet iron AA is lined with fire-bricks as at B. This entire structure rests on a plate C, which in turn is supported by a foundation built of fire-bricks and forming the ash-pit. A cover D is fitted over the top of the furnace and should be lined with fire clay or other protective material. The grate E is supported at one end by brick foundation and at the other end by a supporting bar as shown. The ends of this bar fit into the sides of the ash-pit. The door F is merely a piece of sheet-iron placed at the mouth of the ash-pit to cut off the draft and for use when employing forced draft. The pipe G is for the

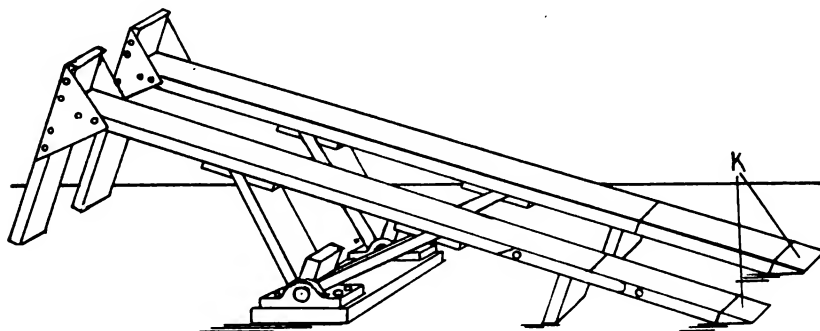


FIG. 1.—THE MACHINE IS RUN UP THE INCLINE

three-cornered plate G and a bracket H. The V shaped supports are attached to the planks by means of the blocks at J J. The three-cornered plate on each side of each V support takes up the wear at this point and likewise helps to strengthen the support. Should it be necessary, a cleat or two may also be used to strengthen this support.

the centre of the old screw and drill it out. This was not very satisfactory, for some times the drill would run off to one side and spoil the thread. Then again, a great many of these set screws are case hardened and a bit won't cut them.

After giving the subject much thought, we hit upon the following method,

purpose of carrying off the smoke and gases after combustion has taken place in the furnace. This pipe may be of cast-iron and lined with fire clay to protect it from the heat of the furnace. This pipe or flue should be sufficiently large to allow the gases to escape easily and should connect with a chimney or stack of a size sufficient to create a good draft in the furnace.

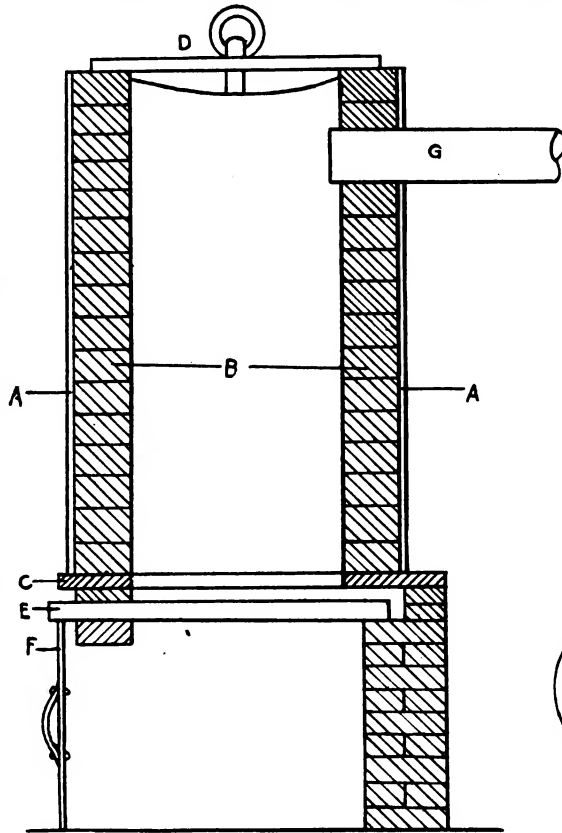
The furnace is now ready to be charged. This is done by building a fire in the furnace and having it well under way before placing the crucible in position. There should be at least a depth of 8 or 10 inches of good, hot fuel on the grate before the crucible is placed. The crucible is now packed, but not "jammed," full of metal and placed upon the bed of hot fuel by means of crucible tongs H. These should grasp the crucible easily and firmly. After placing the crucible evenly on the fuel, the tongs are removed and fuel is gently packed down between the crucible and the furnace lining and to within an inch or two of the top of the crucible. The furnace is now closed and the sheet-iron door F removed to create as much draft as possible. Or should a forced draft be used, this piece of sheet-iron is left in position and the end of the blast pipe insert-

ed in the ash-pit and turned upward toward the grate. As the crucible needs adjusting from time to time, the tongs are again brought into play. The crucible is lifted and the fuel at the sides allowed to settle under it and new fuel packed around it. This keeps a sufficient body of burning fuel beneath the crucible to insure the melting of the metal.

In melting any metal care must be exercised not to keep it in the furnace any longer than is absolutely necessary. Overheating or heating beyond the proper temperature is never productive of good results and as a usual thing, ends in some injury to the metal. Perhaps the easiest method for the novice to determine the proper temper-

ature for pouring is to insert a rod into the melted metal. Should it come out clean with no metal clinging to it, the crucible should be removed from the furnace and the metal poured.

It is not within the province of this article to go into the making of moulds, but should any reader desire information on any points along this line, the writer will do his best to answer them through these columns. In some future issue the writer hopes to explain the making of a simple cupola for the melting of iron. This cupola to be constructed primarily for use in the small shop where



THE FURNACE IS MADE OF SHEET IRON LINED WITH FIRE-BRICK

an occasional casting is required. Iron can be melted in a crucible, in the above furnace under certain conditions.

#### Wagon Lettering for the Vehicle Painter.—5.

F. L. MARVIN.

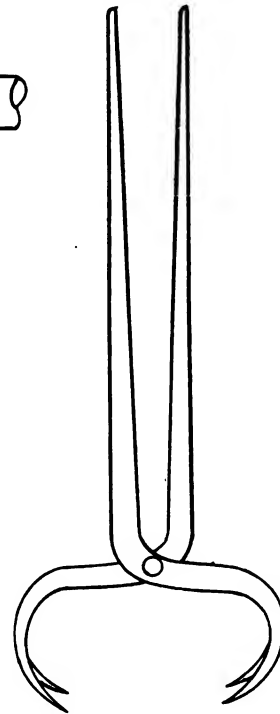
The styles of lettering and the alphabets used by the wagon letterers of today are almost without number. Every day one finds styles and patterns that are new and the veteran letter-artist changes the style of his lettering as often as circumstances demand it. Perhaps the most commonly used style is that known as the roman. This style is graceful, distinctive and is practically free from all stiff effects. The letter is perhaps somewhat difficult

to execute, but is well worth the effort to draft it correctly. Extreme care must be exercised to mould every letter of this style correctly—the straight characters fully drafted and the curves and sweeps carefully and easily drawn. The roman style is especially adapted to the needs of vehicle lettering—it being easily extended or condensed to suit the case in hand and easily read in any of its several forms.

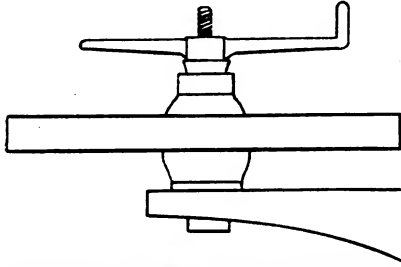
Italics are used to good advantage on most any vehicle requiring lettering and to those who have mastered the ordinary or vertical stroke letters, little if any difficulty will be experienced in mastering the italic style. The great aim in the drafting of italics is to get the same degree of angle on each letter, that is, have each slant parallel. An easy way of doing this, is to draw several slanting lines at exactly the angle you desire your letters to appear, then in drawing your letters, have each of them slant parallel with these lines. Of course the spacing between letters and words may be varied to suit the conditions as in other alphabets. The angle or slant of italic lettering may also be changed according to conditions. The slant decided upon for any piece of work must, however, be maintained throughout the

entire job, if any degree of beauty and artistic effect is desired. The italic form may be most any style of letter but the experienced letterer—the veteran—usually has some distinctive style for a slanting letter.

The gothic style, or as it is commonly called, the block alphabet is generally too stiff for the best artistic effects. It is therefore usually modified and the ends of the letters given a slight tip or hook to produce an easy and pleasing effect. This letter is very bold and prominent and is easily read. Right here I wish to say that a wagon letterer to be successful, please his customers and make a name for himself, must take into consideration the nature of the business in which the vehicle is



to be used, the size and style of the vehicle and the tastes of the owner. A big heavy block letter, for instance, will never do on a dainty little wagon for a confectioner, baker or milliner. Nor will a beautiful, flowing script or italic look well on a coal or ice wagon. The lettering must fit the wagon, the



A WHEEL JACK FOR THE CROWDED SHOP

business and the owner. A little observation along these lines will aid the would-be-letter-artist very materially.

The alphabets generally known as ornamental are numerous. Under this cloak are hidden all styles, more or less pleasing, which cannot be classed under any other heading. As a rule the prospective letterer will do well to leave these ornamental styles decidedly alone. The great curley-cues, pig-tails and twists so much in evidence a few years ago are decidedly a thing of the past and the great aim and trend of vehicle lettering styles is toward simplicity, neatness and plain beauty. The advertising value of a wagon now receives first consideration and as the result has incidentally been a higher standard of beauty and finish, the craft has been the gainer in more ways than one.

#### A Novel Wheel-Jack.

FRED WEEKS.

On a recent jaunt through a section of the country not over a hundred miles from the capitol of these great United States I came across a rather quaint style of wheel-jack or support. The shop in which I found the device is typical of the country. It contained the usual equipment of old springs, tires, axles and what-not, an anvil and an old brick forge. When I entered the shop I found the smith at work on a large wagon wheel which he had on the anvil. A rod resting in the hardy hole prevented the wheel from sliding off. In viewing this device it occurred to me that a very serviceable affair could be made by forging a stout rod to fit tightly into the hardy hole with a flange at the bottom end, the rod to be thrust through the bottom side of the anvil. A thread on the opposite end of the rod will allow for a nut to be screwed on to tighten the

wheel solidly to the anvil. This simple arrangement may be further supplemented by an improved nut and a hollow tapering block. This block is round and tapering, the size being such as to allow of its being used on the large as well as the small wheels that come in. A hole is bored through the center of the block so as to allow of its being placed on the threaded rod easily. The improved nut is simply a large nut fitted to the threaded rod and having two handles attached to opposite sides, the end of one handle being turned up as shown in the engraving.

This device probably savors very much of the "make shift" but a special wheel-jack takes up lots of room and in a small shop this arrangement will be found most economical.

#### A General Talk on Repairing Automobiles.

DAYTON O. SHAW.

There is a great deal a village blacksmith can do in repairing autos and yet not keep anything in stock which will not be useful for many other things. Of course, there is the forge, but he should have a brazing outfit for use when he can't weld and a soldering outfit when he can't braze. This equipment is not costly and it requires but little experience to do a fair job with it. When people find out he can do such work, he will have something to do all of the time. The smith should keep on hand different sizes of steel wire to make small coil springs. I should prefer annealed wire, it is so much easier to work when cold. He should also keep on hand flat steel for leaf springs. The following incident shows another use for steel wire besides making springs. A machine was stalled with a broken chain. The man had no extra links, so he wreathed some small steel wire through the ends of the chain thus forming a link. This held until he got home. Another auto, ten miles from a machine shop, had a broken ratchet, (this goes on the end of the crank shaft, which is used for a starter). To get this machine going, the end of the crank shaft was chipped around with a cold chisel, until the dog would drop down low enough to catch. This did not weaken the shaft to do any harm.

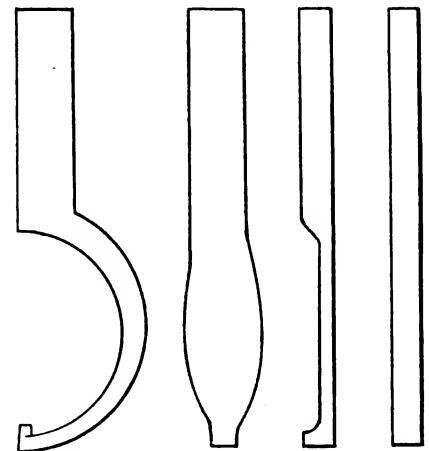
More might be said along this line, but let us now look at the tools which are very important for the automobilist. He must have the spanner and the different kinds of wrenches and screw drivers. Items about sockets and fork wrenches have already appeared in THE

AMERICAN BLACKSMITH, but the split screw driver I believe has not been mentioned. To make this tool I take  $\frac{1}{2}$ -inch square steel and turn the end at right angles and flatten it out thin. The shank can be drawn down small and made square. A straight driver may be made on the other end. Now cut out the slot, finish up and temper. To make a spanner I use  $\frac{3}{8}$ -inch round soft steel. Heat one end and flatten over the horn of the anvil leaving a boss on the extreme end. This boss should be worked out in the vise and the end made round. Then take a round piece of iron, the size you want your spanner and drill a hole the size you want the boss. Heat the end and drive the boss into the hole. Finish up, heat again, lock into the hole and form your circle. The accompanying engraving illustrates the various stages in forging a spanner.

#### A Convenient Post Bench.

T. J. KING.

The accompanying engraving shows how we made use of a center post in the shop. We needed an extra bench, but, not having any room to spare near the walls, finally hit upon this scheme. The bench is constructed of quite heavy planking and is well braced as shown. The entire material used was found about the wood shop and the vise we purchased from a neighboring machinist. Hooks and pegs were driven into the post to hold tools and a few narrow pieces of wood nailed to the post in such a manner as to allow chisels, screw drivers and such like to be placed between



THE AUTOMOBILE REPAIRER MUST HAVE SEVERAL SPANNERS

the pieces of wood and the post. For the accommodation of files we drove several sets of hard wood pegs into the post as at PP. These were put in by boring the required number of holes at



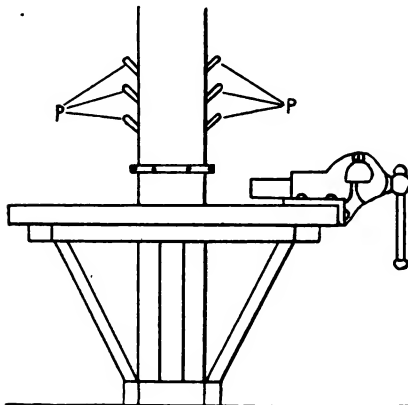
thesame angle and then driving the pegs, which were, of course, tapered and slightly larger than the holes so as to be rigid. This rack prevents the men from throwing the files on top of each other in a drawer and therefore lengthens the life of the files.

I submit this in the hope that it may help some brother craftsman. That this bench is very practical is readily apparent to the average craftsman. It is accessible from four sides and where a large force is necessary in small quarters this feature alone is sufficient to recommend it.

### A Simple Bench Shear.

F. G. MOORE.

The accompanying engraving shows a simple shop-made shear which can be attached to the regular work bench. This device will be found most handy and convenient for cutting all kinds of sheet metal and being narrow, can also be used for shearing long strips. The tool is made as follows: take a piece of T-iron about twenty inches in length and after inverting it, cut off about two inches from each end of the upright. This will now give you a piece with a base 20 inches long and an upright flange 16 inches long. Holes are now drilled in this piece as shown in the engraving. The movable jaw is made of some suitably sized stock and is shaped as shown. After shaping, holes of the required size and number are drilled. The knives are now made. These should, of course, be made of steel. They may be about 9 or 10 inches in length by 2 inches in width and about one-quarter of an inch thick.



THE CENTER POST IS HERE USED TO GOOD ADVANTAGE

They should be carefully forged, ground, hardened and tempered and then bolted to the jaws in such position as to work properly. The two parts are now bolted together as shown—the steel knives being in such position as to work

in contact and to slide past each other when the movable jaw is brought down. The lever or handle is now made and connected as follows: Two pieces of  $\frac{1}{2}$ -inch stock about three inches long are fastened, one on each side at the end of the lower jaw. The handle is then bolted to work between these two pieces. Now join the handle to the the upper jaw by means of two pieces of  $\frac{1}{2}$ -inch stock—one piece on each side of the jaw and handle. In order to have the handle work in line with the knives, the links attached to the lower jaw are offset slightly toward the movable jaw.

### A Talk on the Credit Question.

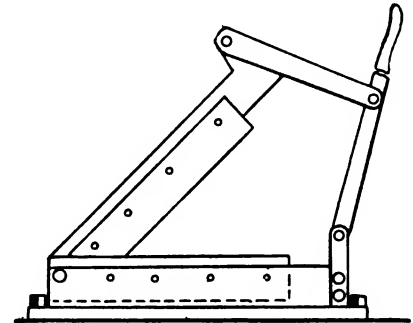
P. M. WADE.

I noticed in the April issue a good article on the credit question, which I enjoyed very much. I have had some experience along this line. I do most all kinds of work and credit most all classes of people. Though don't understand me to advocate credit more than is just and fair. If we did not have any credit system we would be in a critical condition. I have one or two customers that will not pay anything if they think they will not be forced to pay. The way I manage them is to treat them just as kind as possible; ask them what I can do for them just as if they didn't owe me a cent and inquire about their family and business and tell them how I am getting along. Then I ask them if they can help me a little, for I have a hardware bill that is due and I have to pay it and if I can just get a dollar or two from each of my customers it will help me out of the present pinch. It seems to me that most every man can hustle around for that much and help to keep things moving lively in the community.

Most every smith needs a little work done about his place so just keep soliciting the slow payer to do this work. Tell him your gate needs repairing or you need some railings or a load of stove wood or the orchard pruned. I can make such fellows pay one way or the other. Their blacksmith bill don't amount to more than four or five dollars per year and if you lose a dollar or two on him, you don't lose much for there isn't more than three or four such fellows in the community. Let us work for most every one of these poor fellows. I very often find a man that is more than willing to pay for his work, but he cannot at the present and may be for one or two years. But the idea is to keep busy. Your pay will come sooner or later and it will never come

in at the wrong time. I find it best however, to avoid using material, that you paid your money for.

I would advise every brother to buy all of their hardware from some jobber or dealer that sells wholesale only, for you can save a nice percentage on bolts, shoes, nails, bar and rod iron and every-



HANDY TO HAVE ON THE WORK BENCH

thing you buy. Don't go to a retail store for anything that you can get from your drummer or the house which you buy from and if you don't buy from a wholesale house at the present, my advice is to begin as soon as possible. I have been buying from one of the best wholesale houses in our state. When I was building my shop a drummer came along and as the mud was very thick and sticky around the shop I thought he wouldn't get out of his buggy to sell me an outfit. But when he drove up he asked if he could sell me an outfit, climbed out of his buggy and sat on a block. He took my order and my goods arrived. The next time the drummer came I had a dry place for him and again ordered a supply of stock. I am buying from that firm yet and my advice to every brother is to go to a retail store as seldom as you can.

### Hardening Machine Finished Work.

X. PERT.

In hardening machine finished work such as dies, milling machine cutters, etc., made from high-speed steel we must proceed as follows: For finished work we will pack in the muffle as in annealing, bringing the heat up and testing. When heated sufficiently, remove the cover of the muffle and plunge the work into a bath of oil composed of equal parts each of lard and raw linseed oil. Keep the tool in motion while in the bath until it has cooled down to about the boiling point. It can then be removed from the bath and left to cool slowly in the air, when after being cleaned and polished, the tool is ready for use.

### The Useful Plough.

ANONYMOUS.

A country life is sweet!

In moderate, cold or heat,

To walk in the air, how pleasant and fair!

In every field of wheat,

The fairest of flowers, adorning the bowers,

And every meadow brow;

So that I say no courtier may

Compare with them who clothe in grey,

And follow the useful plough.

They rise with the morning lark,

And labor till almost dark;

Then folding their sheep, they hasten to sleep;

While every pleasant park

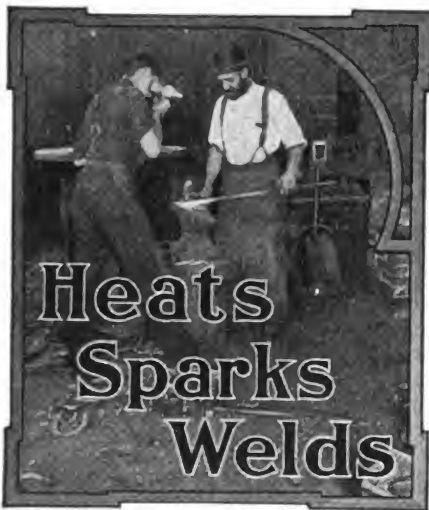
Next morning is ringing with birds that are singing

On each green, tender bough.

And what content and merriment

Their days are spent, whose minds are bent

To follow the useful plough.



'Tis the little leaks that make the losses.

A file that wears but makes no noise—time.

The right time to clean up is today—not tomorrow.

Have you sent in yours? We are always glad to get good shop pictures.

The next international exposition is to be held in Dublin, Ireland in 1907.

If you prefer—a slender income—a life of want and worry—it won't pay you to advertise.

"Every employee is an advertisement," said Thornton, "and he has no right to be a bad one."

Men can be easily classified as the wills, the wont's and the cant's. To which class do you belong?

New York, while about half the population of London, consumes four times as much electricity as the English city.

A fool knows enough to respect his superiors, but it's the wise man who's courteous to those beneath him.

Most prosperous to the farmer has been the past season. Present your bill now and you're likely to get your money.

Roussellere, the tenor who recently sang in New York for \$1,000 per night was a poor blacksmith in France a few years ago.

A good time—to give the shop a coat of paint—to send in a new subscriber—to do

the hundred and one things you should do—is now.

Trade in your locality—how is it? Should be getting ready for a brisk fall season. Don't let the rush find you unprepared.

A winning combination—an up-to-date smith with up-to-date tools in an up-to-date shop and THE AMERICAN BLACKSMITH always handy.

Imaginary troubles or any other kind are best dispersed by hard work. There's nothing like it for body, mind and business. Keep hustling.

Some idea of the amount of brass sold in the United States last year may be had when we know that one firm alone disposed of over 200,000,000 pounds.

The last number of volume five is this and the time to send in an interesting item is now. Don't let another volume go by without your being represented.

Anything good, no matter how small, always creates a desire for more. Take particular pains with the first job—it may lead to more and then be particular to hold that trade.

The navicular bone of the horse's foot derives its name from its peculiar shape, which is somewhat like that of a boat. Navicula is the Latin term for boat from navis a ship.

A diplomat of the first water must be the successful smith. First he must get the order, then do the work satisfactorily and finally get his pay. But the smith is doing it every day and well.

Do you know—your profits—your losses—your expenses—your costs? A good system will tell you. Even a row boat will sink if it leaks. No business is too small or too large for systematic methods.

A recent visitor and a ship smith said, "I carry my copy with me always. Calculation of stock never puzzles me." He referred to his copy of Fodens Mechanical Tables—his constant companion.

There's little that will knock a man out so completely as continuous overlifting and overworking. Get a gas engine to do your work. Good labor-saving tools will last longer and give better satisfaction.

'Bout time to drop business cares for a vacation—if you haven't already done so. Take the other member of the household along. You'll both come back greatly refreshed and ready for the fall rush.

His waking hours are most all spent in the shop. Therefore, shop conditions should be of the best. 'Tis sunshine and pure air that make health and strength of body, mind and character—not smoke and soot.

It's not quite fair to blame the manufacturer every time the gas engine balks or refuses to run. The fault is very often found nearer home. Keep cool and look over the engine carefully before complaining.

"A most opportune time for the formation of branch associations," says the secretary. "A few cents advance in prices now will make a big difference when you come to count up the profits after the busy season."

A surprise awaits you in the next number. You'll hardly know "Our Journal" with its new dress, new trimmings and many other changes. Better renew promptly so as to insure your getting every number regularly.

A diamond automobile was one of King Alfonso's presents to his bride. The brooch is a copy of the King's automobile, the top of the tonneau being of rubies and the door when opened disclosing a picture of Alfonso himself.

Seldom does the progressive hustling smith find himself without work. When this condition threatens he goes out with his business gun and bags some business game. Is work slack in your parts? Better polish and clean your gun.

Subscribers to THE AMERICAN BLACKSMITH encircle the globe. England, Australia, New Zealand, South Africa, India, Mexico and South America are among the countries to which "Our Paper" carries the light of better smithing methods.

The palace of Escorial in Spain is said to contain 1,860 rooms, 6,200 windows and doors, 80 staircases, 73 fountains, 48 wine cellars, 8 organs and 51 bells. Its circumference is almost half a mile. This giant among palaces is usually referred to as the eighth wonder.

Calendar orders have already started to rush in—smiths are speaking early to insure a supply. You'll need to think quick or you'll be too late. Surely you'd spend 4½ cents to get a customer. Forge the first link of a vigorous customer-getting campaign by reserving a supply now.

"Gone on a vacation" replied Mrs. Tom, when we inquired for T. T. "No, he went alone. Didn't want to be bothered with the children. I expect he'll stay about a month." In the meantime Mrs. Tom, poor soul, is sweltering and working and at the same time trying to give the children an occasional holiday.

From Belgium comes the report that during the past few years horse breeding has become one of the most lucrative resources of farmers. The year 1905 was especially noticeable for the great activity in the sale of breeding animals, especially animals 4 and 5 years old, which readily sold at exceptionally high prices. A good draft gelding brings from \$347.40 to \$482.50. Full grown animals are rare, and horse dealers find considerable difficulty in procuring horses 4 and 5 years old. Animals for breeding purposes have greatly increased in value, and even young colts just weaned easily bring from \$193 to \$289, as much if not more than was formerly paid for a full-grown stallion. Stallions of good pedigree and form now bring fancy prices, \$3,860 to \$5,790 being now as easily obtained and not considered more exaggerated than the \$386 or \$579 paid for similar animals some fifteen years ago.

Naturally the very considerable increase in value of animals for breeding purposes returned excellent profits to breeders. During the past year a large number of stallions were sold, among which were some remarkable specimens. Germany continues to be the leading buyer of Belgian horses. German buyers confine their purchases to high grade and high priced animals. Since the St. Louis Exposition, American horse dealers have bought a large number of fine stallions. It is generally recognized however that American buyers are more attracted by the size and weight than by the beauty and form of the animal.

### The American Association of Blacksmiths and Horseshoers.

Did you read that article on page 207 of the August issue? The conditions described by "A Village Blacksmith" were certainly ideal and if you did not read the article, turn to it immediately and scrutinize every word of it. These conditions should be the conditions enjoyed by every blacksmith and horseshoer throughout the country. There is no reason why every county in every state cannot be placed upon such a foundation of good fellowship and brotherhood. There is nothing that will do more to elevate the standard of the craft than a good live national organization. But the only way to secure a national association is to get every smith to work individually for this end. We must build with the county to make the state association and then we will find it easier to secure our ideal—a good live, national association.

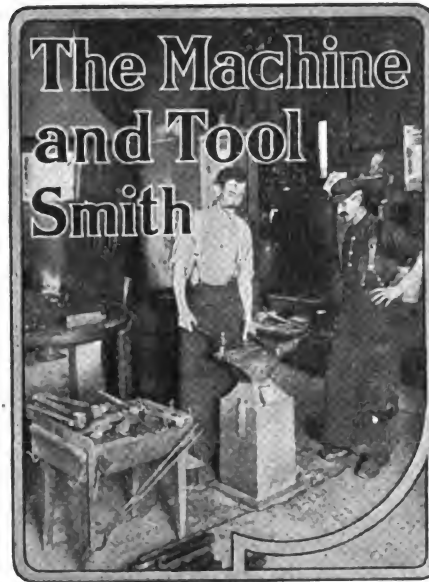
But it means work for every one of the craft. Sitting in the shop and thinking of ideal conditions will do little good. Action is needed. And prompt action on the part of one good, live smith in each unorganized county throughout the country will quickly and surely bring the desired effect. The time for laying plans for the formation of a county organization is *now*. There is no time like the present for doing things. Suppose you start your association by writing for our complete plans, address THE AMERICAN ASSOCIATION OF BLACKSMITHS AND HORSESHOERS, P. O. Box 974, Buffalo, N. Y. By return mail will come plans for the formation of a county organization. But do it now Mr. Reader. Don't wait for more time, when you will very likely have forgotten about this.

### The Mechanics Mutual Benefit Association of North Dakota.

This association was recently organized at Grand Forks, North Dakota for the benefit of blacksmiths, horseshoers, wheelwrights, machinists, boiler-makers, etc. Officers were chosen for the first year, as were also executive and legislative committees. An employment bureau was also established and an equitable scale of fair prices is to be put into effect immediately. A good, strong lien law is also to be drafted, presented at the next session of the legislature and every means taken to make it a law.

There were quite a number of representatives of supply houses and manufacturers present at the meeting and they helped materially in perfecting

and clinching the bands of organization. The next meeting of this association will be held in Bismarck, South Dakota, in February and over 400 craftsmen are expected to attend at that time.



If upsetting is properly done the steel will not be harmed. The piece should be heated to a bright red, and upset to a somewhat larger size than desired so that it may be thoroughly and solidly packed. G. L. F.

When it is desired to case-harden only part of an article, the part of the work which is to be soft may be copper plated. The carbon will not enter through the copper. Another method is to cover the parts desired soft with fire-clay. W. O.

To get an idea of the hardness and quality of a steel quickly, try a chisel made of it. Great demands are made on the resistance of a chisel to shocks, on its power of keeping an edge and on its toughness. Hence a steel which has made a good chisel may be depended upon for a majority of cutting tools. REISER.

### Hardening and Tempering Steel—11.

E. R. MARKHAM.

#### Case Hardening.

When we harden a piece of steel containing more than a certain percentage of carbon we first heat it red hot, then plunge it in a cooling bath. The rapid cooling causes certain chemical changes which result in extreme hardness. When necessary to harden wrought-iron or low carbon steels, it is accomplished by supplying sufficient carbon to the stock by heating it in combination with some carbonaceous material. If it is subjected to the carbonizing process for a sufficient length of time the carbon will penetrate to the center of the piece—provided it is not too large and it may be hardened throughout. If, however, the carbon

does not penetrate very deeply when it is hardened, the result is a soft interior and a hard surface, or case. This is known as case hardening.

There are several methods of imparting sufficient carbon to the surface of iron and low grade steel. The method employed depends upon the means at hand, and the requirements of the piece of work. When there are but few pieces, as screws, nuts, etc., they may be heated red hot and a little powdered cyanide of potassium may be sprinkled on them. They are then replaced in the fire and again heated red hot. If it is necessary to have the hardened surface very deep, the operation may be repeated several times. The pieces are then plunged in water and quickly cooled. The same results follow if yellow prussiate of potash is used. As this does not scale from the work as readily as the cyanide, a little salt is mixed with it. Salt, prussiate of potash and other ingredients are also mixed in varying proportions to form hardening mixtures. So we find one blacksmith using equal parts of prussiate of potash, sal-ammoniac and salt-peter. Another uses a mixture of equal parts of prussiate of potash, sal-ammoniac and common table salt, while a third will use the same ingredients but will vary the proportion of the ingredients.

When several pieces of one kind are to be case hardened a quantity of cyanide may be melted in an iron dish. When this is heated red hot, the articles, having been wired, may be suspended in the molten cyanide and allowed to remain for a time depending upon the desired depth of the hardened portion. They may now be removed and dipped in clear, cold water. In some shops where large quantities of work is carbonized by heating in red hot cyanide, special crucibles of cast or wrought iron are provided. However, as the fumes are poisonous, it is necessary to provide some means of carrying off the gases. At times prussiate of potash and salt are used the same as cyanide; the proportions varying for different purposes.

When many pieces of a kind and size are to be case hardened, it is advisable to pack the work in an iron box together with some carbonizing material and subject the mass to a red or yellow heat until the carbon has penetrated to the desired depth. For the general run of work the carbonizing material is raw granulated bone. This may be procured from the dealer in any desired size of

kernel. For very small pieces which are not to be hardened very deep, use the finest. If the pieces of work are of a size that require a longer exposure to the carbonizing material, use the next coarser grade. If the pieces must be hardened, deep, then select the coarsest, as it will continue to give off carbon for a longer time than the finer grades. For ordinary work, it is advisable to mix with the bone an equal amount of wood charcoal, ground so the kernels are of about the size of the kernels of bone. When packing in the box, first place a layer of bone and charcoal 1 or 1½ inches deep. On this place a layer of work to come within 1-inch of the walls of the box or within about ½-inch of each other. Now another layer of packing material is added, covering the work to the depth of about one-half inch. Then a layer of work is added, then more packing material and so on, until the box is filled to within one inch of the top, when the box may be filled with the packing material, the cover put in place and the space between the cover and box filled with fire clay, mixed with water to the consistency of dough. The operation of filling the space between the box and cover is known as sealing or luting. When the luting is dry the box may be placed in the furnace, which is generally of a size that allows several boxes to be heated at a time. The boxes should be marked to distinguish those containing pieces requiring different depths of hardened surfaces.

Knowing that under ordinary conditions carbon penetrates iron at the rate

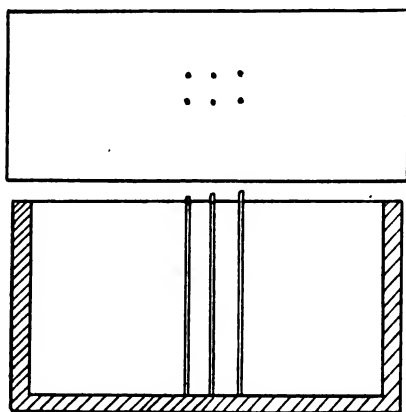


FIG. 1. TEST WIRES TELL WHEN THE HEAT IS RIGHT

of ⅛-inch in 24 hours, we may be able to gauge the length of time the work should remain in the furnace, if we know when the contents of the box are at a red heat. This may be easily ascertained by having holes drilled in the center of the cover as shown in Fig. 1. Wires about ⅛-inch diameter should be run

down through these holes to the bottom of the box as shown. When it is thought sufficient time has elapsed for the box to become heated throughout, we may by means of tongs remove one of the test wires. If it is red hot its entire length, note the time. If not red hot, close the door and allow 15 or 20 minutes to elapse. Then remove another wire. Continue this, until a wire shows red its entire length, when we may be assured that the entire contents of the box are at the desired temperature. If the pieces are quite thin and we are desirous of only a thin hardened portion, it may be that an exposure of from 1 to 2 hours is sufficient. If, on the contrary, the pieces are large and need hardening ⅛-inch deep, they should be packed with the coarsest grade of bone and run for 12 to 14 hours, then packed again with fresh material and subjected to heat for a period equal to the first.

When work to be hardened must, for any reason, be hardened at the heat used in carbonizing and the shape is such that high heats would make it weak, then the carbonizing heat must not be above a good red, as high heats, especially if the pieces are of steel, have a tendency to open the grain and make the stock porous and weak. If a second heat is allowable, then the first heat may be to a full yellow, the stock absorbing carbon faster at the high heats. When the pieces have been subjected to the heat for a sufficient length of time, the boxes may be removed from the furnace and allowed to cool off. After cooling they may be heated separately and hardened the same as though made from tool steel, or they may be placed in a box without any carbonizing material, heated to a low red and dumped in a tank of water, or such liquid as will produce the desired results.

Many times the smith in a small shop, not provided with hardening boxes and furnaces finds it desirable or necessary to case harden a number of pieces. This may be accomplished by taking a piece of gas pipe of the proper size and length and screwing a cap on one end, or plugging the end with an iron plug. Then place in the pipe alternate layers of work and packing material. When the pipe is filled, a loosely fitting plug is placed in the open end and the space between plug and pipe is luted as described. Unless the pipe is too long it may be heated in an ordinary blacksmith's forge. Many times, case hardening may be accomplished by packing the articles in granulated charcoal alone.

In a previous paragraph we spoke

of the use of raw bone. For certain work this material will not prove satisfactory and if used the stock will be found very brittle. This results from the absorption of a considerable percentage of phosphorus from the raw bone. To overcome this tendency the bone may be charred by placing it in an iron box or tube, sealing the cover and heating it to a red heat. It may then be removed from the furnace and allowed to cool in the box. Charring

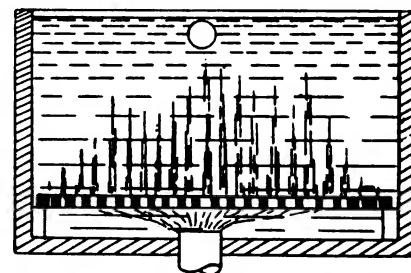


FIG. 2. ALL PARTS OF THE WORK SHOULD BE EXPOSED TO THE LIQUID

removes the phosphorus, thus preventing it from penetrating the steel or iron and making it brittle when cold.

When work has been heated in the case hardening furnace long enough to insure desired results, it may be dumped into a tank of water, or other cooling liquid. It is necessary to exercise care that the work enters the bath in such a manner that all parts of the piece be exposed to the liquid. If the work is dumped in a "lump" much of it will not come in contact with the water and so will not harden. For this reason it should be sifted from the box a little at a time. If the tank is shallow a piece of wire netting should be placed several inches from the bottom, so that a stream of water projected from a pipe at the bottom as shown in Fig. 2 will come in contact with the pieces and insure their hardening entire. If the work is heavy and we wish to produce nice colors, the pieces should be wired with iron binding wire and each removed from the box separately and moved around in the water until the red has disappeared, when they may be allowed to remain on the screen at bottom of tank until cold or until all the pieces have been hardened.

(To be continued.)

#### A Discussion on Tire Setting.

S. W. SHORT.

Mr. Cold Setter: "Say, Hot Setter, old man, I understand that you don't approve very strongly of my methods."

Mr. Hot Setter: "Indeed I don't. The idea of trying to set a tire cold,



and when it is on a wheel. You can't have any measurements to go by. You have undertaken something that won't work."

Mr. C. Setter: "Hold on Mr. H. Setter let us see who is right. Let's

Mr. H. Setter: "But, Mr. C. S. I don't think you can draw a tire all around the wheel without damaging your wheel."

Mr. C. Setter: "In what way, Mr. H. S.?"

mark and set to it every time? Perhaps you never look to see if it is there but swear to it."

Mr. H. Setter: "No, I don't do that, but I see you have as good a way to tell when it is tight enough as I have. Simply look and see."

Mr. C. Setter: "There are still a few old blacksmiths who say, 'don't upset your tire, you will ruin it. Cut it and weld it.'"

Mr. H. Setter: "Yes, but anyone knows that it is not the best way. We have men who argue for that old way, because that is the method they learned and of course they hate to give it up."

Mr. C. Setter: "Yes, and there was a time when they used pieces the length of the felloe, breaking the joints with them."

Mr. H. Setter: "Of course, they have improved on them. And I must confess that even the cold setter has improved. But, Mr. C. S. how about setting wheels when you don't take off the tire? How can you tell that the spokes don't need wedging?"

Mr. C. Setter: "Can't you tell when one moves?"

Mr. H. Setter: "Yes, I guess I can. But suppose just one spoke needs wedging."

Mr. C. Setter: "Then just take off tire enough to wedge that one spoke."

Mr. H. Setter: "Don't you break down the pores of the iron or steel, and



THE NATIVE FILIPINO TRANSPORTS HIS HAY BY MEANS OF A CRUDE SLED DRAWN BY A WATER BUFFALO

see if I can't do it on a better plan than you can. I take my tire off and wedge the spokes and as for the rim bound wheel, I can saw that out more accurately than you can, while the tire is on and clamped in the machine."

Mr. H. Setter: "Well Mr. C. S., if you have to take your tire off and wedge up, what's the need of a cold setter? Just bring the tire to me, I will set it hot."

Mr. C. Setter: "The customer has a good buggy and doesn't want the paint knocked off, and he wants the wheels all the same, and you cannot do it. I don't have to run the tire nor the wheel (which is guess work to a great extent) and I don't have to heat my tire to set it. I can set two to your one or three to your two at least and when I put my tire back and put the wheel in the machine, I can see just how much it should be set, consequently I don't hurt my wheel, nor knock the paint off, nor soak the felloe, which then has to dry out and leaves the wheel slack or overdished."

Mr. H. Setter: "You say I guess at my work. I simply take the wheel and tire and run them accurately. How can that be guess work?"

Mr. C. Setter: A Mr. Smith told me that he never found two men who could run a wheel and tire exactly the same. He said one man would hold the traveler tighter than others and consequently a variation would occur. This Mr. Smith was a hot-tire man too, and besides, Mr. H. S. you do not plumb the center of your tire and wheel all around everytime and so are not liable to come out just as you expect.

filled last fall and he thought, that probably then your machine would be the best to use. 'But,' said a neighbor, 'Try Mr. C. Setter.' The result was as fine as your hot shrinking ever did, and besides no charred wood under the tire and no wet felloes to dry out. And as for the drawing on old wheels, it will usually take two places as with your hot machine, or else your holes are away off."

Mr. H. Setter: "How can you tell when your tire is tight?"



A QUAIN TWO-WHEELED CART DRAWN BY A SLEEPY DONKEY ASSISTED BY TWO BAHAMA NATIVES

Mr. C. Setter: "Well, how do you suppose? After you have drawn and put it on, do you then pick the wheel up and say 'I got that a little tighter than I meant to' or can you make your

cause the tire to break?"

Mr. C. Setter: "No, that has been tested, and found to work as well as when your hot setter did the work. I think Mr. H. S. that you should either

go back to the cut-and-weld plan, or purchase a cold tire setter, and get to business on scientific principles."

### Proper Shoeing for Corns.

C. A. MALMBERG.

My method of shoeing for corns will undoubtedly be of interest to other craftsmen, and as a description of this method has not appeared I will give it as follows: After removing the shoe pare the foot down, making sure to get the heels down well. Cut the corn out as much as possible, but not too deep so as to leave the foot tender. Now fit the shoe to the foot, and weld a number one toe calk on the side next to the corn so as to cover the first hole at the heel. The other heel is turned as on a common shoe. I have used this method for several very bad cases of corns, and have always had excellent results. A case which I had last fall was exceptionally bad. The horse belonged to a liveryman and had been shod by a neighboring smith. The horse was lame and this smith told the owner that the cause was contracted feet. The owner in coming to me, asked if I could shoe the horse so that he would not go lame. I removed the shoes, and found the heels very long, and the feet dry and hard. In cutting the heels, I found two corns on one foot, and one on another. I pared them out, made the feet level, and put shoes on as described with the exception that the shoe for the foot having two corns was fitted with two calks instead of one. The horse wore these shoes about six weeks, and then the same shoes were reset. The animal is now wearing common shoes, and does not show any lameness.

### Drilling Chilled Castings.

C. P. LOWRANCE.

I believe in helping the craft wherever I can and as I stumbled upon a never failing method for drilling chilled castings, I believe it is my duty to send it to the readers of THE AMERICAN BLACKSMITH. The method is a most simple one and is very cheap. Take the chilled piece and heat the portion that you desire to drill. The piece should be heated to very nearly a white heat. Now take a piece of blue stone or vitriol about the size of a walnut and place it on the heated portion at the spot to be drilled, keeping the heat until the vitriol has melted away. Now shut off the blast and allow the metal to stay in the fire until cool. You can now drill it the same as any other casting.

This method has not failed in a single instance that has come to my notice.

### Split Hoof—Its Cause and Cure.

E. W. PERRIN.

Fracture of the hoof, commonly called split hoof or sand crack, consists in a fracture of the wall of the hoof. The front feet are invariably the seat of the trouble, but occasionally the hind feet are affected. Sometimes the fracture is located at the outside heel, but more frequently at the toe or inside heel of a front foot. Sometimes the fracture commences at the coronet and descends to the plantar surface. Sometimes it starts at the plantar surface and works up to the coronet. In the latter case, the fracture extends



STOVE BOLTS ARE USED TO HOLD THE EDGES OF THE CRACKS RIGIDLY

upwards in much the same way that a split extends along a plank of wood; until it finally extends to the sensitive laminae, when lameness will be the result. In the former case, where the fracture starts at the coronet, it is invariably accompanied with lameness from the first. When the hoof is relieved of weight by the animal raising the foot, it expands at the coronet and contracts at the plantar surface. But when the weight is thrown on the hoof at each step, the hoof contracts at the coronet and expands at the plantar surface, so that when the foot is raised, the fracture in the wall opens and closes when it is again put to the ground, hence, the swollen tissue pressed into the fractured wall while open, is pinched between the edges of the fracture when closed, thus causing bleeding and acute pain. In neglected cases, sand, dirt and other foreign matter gets into the fracture, setting up acute inflammation and occasionally resulting in very serious complications in the foot.

A number of causes may have operated together to produce a fractured hoof, but there is one primary cause in all cases—a weak condition of the hoof. Too much paring of the sole or rasping away of the outer wall, or the use of shoes which put all the weight of the animal on the wall instead of distributing it over the proper bearing surface of the hoof, or anything which interferes with the normal functions of the hoof, will by weakening it, predispose it to fracture. Contraction of the heels is a predisposing cause of quarter crack. Split hoof is very common in laminitic feet, because of the weak condition of the hoof resulting from that disease. Soil and climate also have much to do with the health of the hoof. For instance, on the blue clay of Manitoba, split hoof is very rare, while it is very common in horses traveling on the sandy soil of Arkansas.

I call this treatment new because it is new to me. I don't know of any others having tried it and it is an application of my own idea. It has proved a success. The principal factor in the cure of split hoof is to keep the edges of the fracture solidly together until nature grows a new hoof. This often proves a very difficult problem, because the hoof grows so slow. If the fracture extends from the coronet to ground surface it will take from nine to twelve months to effect a complete cure. If, during this period, the treatment be relaxed, even for a day, in that very day the fracture may extend up through the new growth, in which case the labor of months is lost and the treatment must begin over again. My new treatment consists in simply bolting the edges of the fracture solidly together. Bear in mind, you must not draw the edges of a fracture together while the laminae is congested lest it suppurate, in which case, the imprisoned pus might cause serious complications. Therefore, if there be any lameness, poultice the affected foot until all inflammation has subsided. See that there are no particles of dirt in the crack. The lameness having passed away, the foot is now ready for the operation. Sink a slot in the wall on either side of and about three quarters of an inch from the fracture. See the engraving. These slots must be large enough to carry a small stove bolt, three sixteenths of an inch for a small foot, quarter inch for a medium and five sixteenths for a large foot. These slots must be let down deep enough to admit of boring a hole that will not break out, and yet

not deep enough to cause pressure on the sensitive laminae. Then take a twist drill the exact size of the bolt and bore a hole from slot to slot, file the sharp corners of the nut so that in tightening up, the nut will not cause pressure on the inner layer of soft horn. Now put in your bolt and screw it up. If the fracture extends from coronet to ground surface, use two bolts. As you tighten up the bolts you will see the edges of the fracture come together. In an old case the edges of the fracture may be three sixteenths of an inch apart, in which case do not screw up tight at first, unless you are sure the foot can stand the pressure. If the horse begins to point the affected foot, it is because he cannot bear the changed condition. Therefore relax the screws until he stands in comfort. Now envelop the foot in a poultice and put him back to rest. The next morning you may tighten up a little more. If, however, he still shows discomfort at the pressure of the bolts continue the poulticing and tighten a little each day until the edges of the fracture are drawn tightly together. There should be no surplus bolt projecting beyond the slot after turning the bolts as tight as you want them, fill the slots level with the wall with gutta percha. This will keep dirt and moisture from the bolts, which should be carefully inspected from time to time, and the bolts tightened if found necessary. If the foot is shod with rubber it will help by diminishing concussion, and a stimulating liniment applied to the coronet will help increasing the growth of wall. To be sure it is a question of judgment, of deft mechanical skill to put these holes through the wall just exactly in the right place, but when the operation is properly performed it is eminently successful.

#### A Short Talk on Horse Clipping.

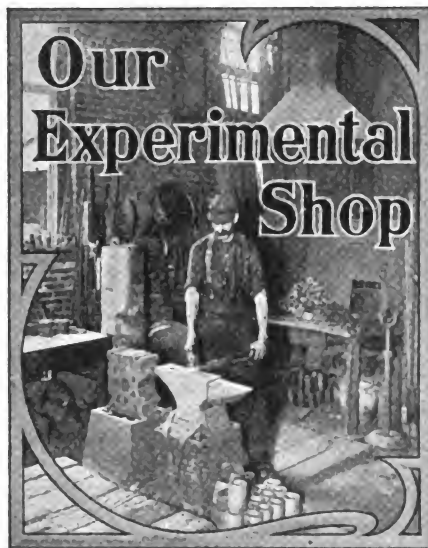
J. L. M'BEAN.

The season is not far distant when horse owners will be found bringing their heavy coated animals to the smith with the clipping machine. An excellent chance for extra profit and every smith with the necessary spare time can well take advantage of it. But for the benefit of his customers, the smith should post himself on the several points necessary to an intelligent use of the clipping machine. In the first place I would caution the smith to secure a good machine. Don't waste money on any kind of cheap tools.

After purchasing a clipping machine, don't think that every horse you see

should be clipped. Horses differ and 'tis folly to suppose that every horse that comes into the shop will be benefited by having its hair cut. Should an animal have a very tender and sensitive skin or a skin prone to disease, it were much better that the hair be allowed to grow. On the contrary, however, should the animal be in good health generally, he will be benefited in every way and be more comfortable by an application of the clipper.

From the view point of the owner, the clipped horse is more easily cleaned and kept clean than is his long-haired brother. It is, therefore, economy to use the clipper. The clipped animal will also do more work, more willingly and be in better spirits than if the heavy coat were left uncut. After removing the heavy coat of several horses, the following conditions have been noted: Improved appetite, brightened spirits, more activity shown and the entire disappearance of the slow and sluggish movements which are the usual accompaniment of a long, heavy coat. In short, the entire constitution of the animal is improved.



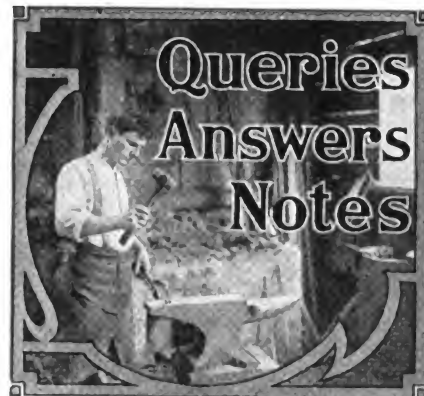
Here will be found brief anvil workings, hints from far and near, shop methods seen or suggested.

The following receipt is excellent for cleaning brass, removing the stains and making the metal as bright as when new. Place two parts of common salt together with six parts of good cider vinegar in a bottle and shake well. Apply it to the metal with a soft cloth and rub briskly. After cleaning, the liquid should be washed off as otherwise it will discolor the brass.

They use the following method for case-hardening cast iron at the shop. A compound is made of equal parts of prussiate of potash, sal-ammoniac, and saltpetre, thoroughly pulverized and mixed. The piece is then heated to a red heat and then rolled in this compound. It is then

plunged while hot into a solution consisting of 2 ounces of prussiate of potash and 2 ounces of sal-ammoniac to each gallon of water.

The kid surprised the boss the other day by affixing a horse-shoe magnet to his broom. The kid keeps the shop looking mighty slick and neat and uses his broom freely and as he is instructed to save all nails, screws and such like that he finds on the floor, he has to stoop a good many times some days. So one day he purchased a horse-shoe magnet and attached it rigidly to the end of his broom handle and he now recovers nails, brads, small screws etc. with little difficulty.



The following columns are intended for the convenience of all readers for discussions upon blacksmithing, horseshoeing, carriage building and allied topics. Questions, answers and comments are solicited and are always acceptable. Names omitted and addresses supplied upon request.

**Joining Hot and Cold Iron.**—I would like to hear from other brother smiths who can weld a cold piece of iron to a hot piece, or vice versa. I can do it very easily and make a good job of it. CHAS. E. TOBIAS.

**To Measure Pulling Power.**—I would like very much to know where I can get scales or balances with which to test the pulling power of horses. Can any one give me this information? F. HOOP.

**Two Dont's for the General Craft.**—Don't use a piece of long iron when a short piece will answer. Don't use a piece of new iron when a piece of old will answer. If the above don'ts are observed, the scrap heap will melt very perceptibly. W. J. BARNES.

**Tempering Malleable Iron.**—Will you kindly tell me whether or not there is any way to temper malleable iron. I have heard that someone has succeeded in so doing and I would like to know if it is so or not. PAUL SAWYER.

**In Answer.**—Articles made of malleable iron, may be hardened by heating in cyanide of potassium. The depth of the hardened portion depends upon the length of time the piece is left in the cyanide. If the articles are to be very tough they should be quenched in oil. A. J. B.

**Wants to Know about Rubber Pads.**—Will some good craftsman kindly give me his ideas on rubber pad shoes for horses? I would like to get all the information I possibly can on this, and hope to see several good practical articles in an early issue. R. W. KNIGHT.

**Another Method to Case Harden.**—In reply to our Brother, Henry Coad, would say melt sufficient prussiate of potash on the part to be hardened to cover it completely. Then dip the piece in cold water while it is red hot and a new file will be unable to touch it.

JOHN R. KING.

**To Stop Forging.**—Brother Samuel Owen tells Brother Walsh to side-weight his forger. I would say not to, but to shoe your horse with a straight shoe, putting a slightly heavier one in front than behind and to trim the feet level. If it makes him travel one sided, then make him travel straight.

A. S. PRIMMER.

**Wants to Cure Corns.**—I would like some of my brother smiths to tell me how to cure corns without losing the use of the animal during treatment. What causes a chalky substance to gather in the feet of some horses? This is especially so in the feet of lame horses. What causes lameness in such horses.

A. S. MITCHELL.

**Shoeing for Cross Firing.**—I would like to ask some brother smiths to give me a good method of shoeing and trimming the feet to correct the gait on a horse that cross fires. I have now shod the horse very much heavier on the outside than on the inside and with a 12-ounce shoe. I am new at blacksmithing, but am very willing to learn.

FRED DETTBRENNER.

**Pardon the Crow.**—I thought I would step in a few minutes, as I am a new beginner in the shop, and have just received my first copy of THE AMERICAN BLACKSMITH. I think it is the best paper I ever saw. Mr. Editor, I do not blame you for saying you would return my money if I wasn't pleased with the paper. I would not take the year's price for the June copy. Every smith should read it.

W. J. SMITH.

**About that Lame Colt.**—I noticed one of the readers has a colt which has gone lame because of improper shoeing. Some brother says that the smith has drawn the shoe toe tight, but I think if he will rasp the foot level, and concave the hoof with a knife, he will have no further trouble. In concaving the hoof, I mean inside of the sole, so that the shoe will not rest on the soft parts of the foot.

T. C.

**A Shop Floor of Cement.**—I am about to build a shop of cement blocks, and also intend putting in a cement floor. Will some reader of THE AMERICAN BLACKSMITH kindly tell me how a cement floor will wear in a shop? How shall I build it? I am thinking of putting up a building 50 feet square, but would like to hear from some of my brother readers before going ahead.

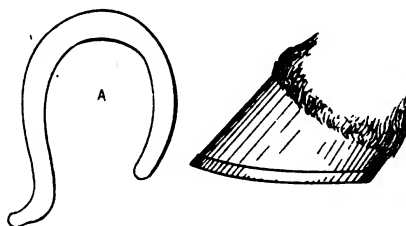
E. ANDERSON.

**What Machine to Install.**—I see a great deal in our papers regarding the machines to install in the shop, but I have yet to see anything about what I call "our best help." I refer to the type-writer. I think it is as necessary as the drill. I find it very handy. It saves lots of time in making out bills, writing letters and lots of other things just as important. Therefore, brother smiths, invest in a typewriter.

ALVA S. PRIMMER.

**The Forger or Over Reacher.**—Take a shoe with a clip each side of the toe and well under the foot. Have the outside branches

of the heels about 1½-inches longer than the inside and turn these longer branches out from the foot. This idea is based on the



SHOEING THE FORGER AND STUMBLER

assumption that a horse's heels touch the ground first. The engraving A shows the shape of the shoe.

W. J. BARNES.

**To Shoe a Horse that Stumbles.**—Take an ordinary shoe and curve the bearing surface as shown at B. In this case it is advisable to dispense with the clip altogether.

W. J. BARNES.

**To Shoe a Knee Hitter.**—Forge a shoe that is higher and narrower on the inside and nail it on the foot. If this doesn't stop the trouble, reverse the above by thinning the inside down so that it is not more than ½-inch thick.

W. J. BARNES.

**To Cure a Seedy Toe.**—I noticed in the July issue that Brother J. E. Brown asks how to cure a hole in the hoof of a mule. I do not think it can be entirely cured, but he can possibly stop the lameness by cleaning out the hole thoroughly and stuffing sufficient cotton into it to keep the dirt out. Then shoe in the usual manner, and when the hoof grows, trim it as usual and possibly in time the trouble may be entirely removed.

T. C.

**Wants a Trip Hammer.**—Some have asked the question—does power pay? I say it certainly does. I put in one of the International Harvester Company's 2-H.P. Vertical Engines and it is a dandy. I do not know how I could get along without power any more. I want to put in a trip hammer. Will some one tell me what kind is best? I have never used one and I want a good one. Tell me where I can get a good one. Will some smith who has made one tell me how it works and his way of making?

F. B. NEWELL.

**Weak Heels and Quarters.**—Mr. Mayberry in the April issue tells about shoeing weak heels and quarters. I have some knowledge about this line. I agree with him on several points though not on pressure. To build up the weak points I take off the weight, which will overcome lameness. I use a bar shoe to protect the frog, to keep the weight off and to lift the shoe off the heel of the rim. Place calks as much forward of the weak points as possible. Leave the nails out of the heels if a factory made shoe is used but nail well at the toe.

SAMUEL OWENS.

**Liquid to Spray Horses.**—Please inform me where I can get the liquid with which to spray horses to keep the flies off them.

M. K.

**In Reply.**—Regarding a liquid with which to spray horses, would say that any of the several named below can be purchased from your local druggist. A strong decoction of smart weed is found to be very good and when applied to the animal's legs, neck and ears is found good for a day.

Concentrated oil of laurel is also very good and can be applied as purchased. Possibly the cheapest of all these solutions is oil of tar. This, as well as the others, is perfectly harmless and will in no way injure the coat of the animal to which it is applied.

O'B.

**Stock for Brazing Torch.**—We would like to ask the brother craftsman who described the brazing torch on page 168 of the June issue and who signs himself "B Torch" what size stock he can work with his torch. We have been using a common blacksmith forge for brazing, but it is very difficult to keep the fire clean and a good many castings cannot be secured so as to insure a good job. If a gasoline torch could be made to give sufficient heat for good sized stock, we would be very glad to give it a trial. We have tried this brother's plan as near as we understand it, but cannot heat 1 by ½-inch iron sufficiently hot to braze it.

E. SEIBEL.

**A Talk on Organization.**—I believe that the craft should have a general meeting and by so doing they could get together and form organizations everywhere for mutual benefit. It seems to me that the blacksmiths are "way back and sitting down" when compared with other trades and professions, which are generally up and doing. Now my idea is this: Select some good points that can be conveniently reached from two or more states and then secure excursion rates, advertise well the date of the meeting and have good, capable speakers address the smiths on topics relating to the trade. I then think we could very easily organize a big, strong, national association.

J. W. SMITH.

**A Letter from Louisiana.**—Our equipment consists of a five-H. P. Weber Gasoline Engine, a 20-inch Barnes upright drill, a circular saw, a band saw, a double emery stand, a disc grinder which sharpens discs without removing them from the shaft, a blower which cares for two fires, a grindstone, a jointer and many smaller tools too numerous to mention. We do all kinds of repair work on both buggies and wagons, also a great deal of plow work. In spare time we build wagons for which we get from \$55 to \$75. We saw out all our wagon material from lumber which we get about six miles from here. We also do lots of shoeing for which we get 50 cents per foot, while for resetting we get 25 cents. Other prices in proportion.

A. PERRES & SON.

**Material for the Grinding of Wheels.**—I would like to have some of your readers inform me, what kind of material is used in making a wheel for grinding horse clippers? The wheel I have seen in use is 14 inches in diameter by ¾ of an inch thick and runs on a shaft. The wheel lies in a horizontal position and is faced off perfectly smooth on top. In grinding the blades the grinder wets or oils the wheel and sprinkles powdered emery on the surface. What I would like to know is what kind of material is used in making the wheel—is it soft cast iron or hardened steel? I have asked a local machinist to make one for me and he said if I could find out what kind of metal is used he could make a wheel very easily.

GEO. F. DALY.

**Shoeing a Toe Wide Horse.**—I would like to ask some older member of the craft how



to shoe a horse slightly toe wide behind. The limbs are quite straight, but when he travels, he hits the ankle. When he walks, he rubs the side of the foot just below the hair. This is done with the opposite foot between the quarter and the toe, this portion of the hoof being worn very smooth for about one inch above the shoe. I have shod him with low calks and with a trailer on the outside as he wears out the outside quickest. The shoe is also straight between the quarter and the toe. After shoeing in this manner, I applied paint to the hoof and then drove the horse. I then found that the ankles did not strike while running, but, after going a few steps, the paint was rubbed off. I think the ankle striking has been stopped. Would you suggest side weights for the hoof striking? C. M. PROVIN.

**Filling Sarven Wheels.**—I enjoy the paper very much and get much good information from it. I think there is good sense in some of the articles, but it seems to me that some readers are wasting their time. I do not believe in criticising too much, but I think it very poor business management to waste time making anything that can be purchased cheaper than it can be made. There has been several articles in the paper regarding the filling of sarven wheels. I cannot see any economy in filling a sarven wheel. For instance, there are 16 spokes in a wheel and figuring it at 15 cents per spoke, the wheels would cost \$2.40. I can buy a fair grade wheel at that price, ready to receive the tire and I know it is a great deal better than can be built by hand.

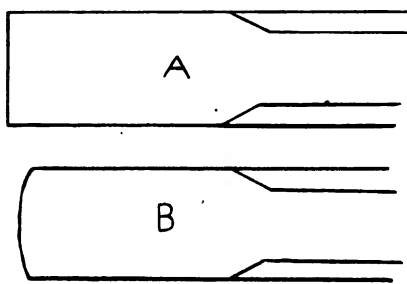
Mr. E. W. Perrin's articles on horse shoeing are very good, but in my experience what will remedy the evil in one horse will not do in another. The only way for us to be successful shoers is to use our judgment—if one remedy does not have the desired effect, try another. J. C.

**To Line a Fire Pot.**—In reply to A. B. R. in the July issue regarding a lining or setting for his fire pot, would say, I can take brick and any good clay and make a fire pot that is much better than any now sold on the market. Proceed as follows: First spread a little clay in which to bed the brick, then set the brick on edge with ends toward the tuyere. These are placed as close together as possible. Of course, there will be considerable space between the outward ends of the bricks. These spaces must be filled with clay and pieces of broken brick. The clay should be as thick as you can work it and must be packed solid. If cracks should appear while the clay is drying out, take a hammer and keep them packed together. If the fire pot is for general purposes, be sure to make it large and roomy, not less than 5½ by 6 inches deep, about 12 inches across and nearly the same in width. I am now using a fire pot constructed in this manner, which I made four years ago, and to all appearances, it is as good as the day I made it, and I have never had to make any repairs on it whatever. JOHN H. ROSE.

**Regarding Hub Augers.**—I desire to criticise Mr. Frank A. Harris' answer to W. H. Tippin in the July number. Mr. Harris says that the Little Giant Hub Auger is the best because you can bore a tapering hole with it. I am well satisfied that the Little Giant is all right, though I have never seen one of them, but taking his

statement without further knowledge of this class of machines, one would conclude that the Little Giant was the only auger that could bore a taper. I use one of Silver's number 3 tapering hub boring machines, which I find is entirely satisfactory. I can bore any kind of a hole that I desire, and never need to wedge the boxes. This machine is a very good one, but I am not prepared to say that it is the best. Very few of us know to a certainty which is the best of anything, especially when we have had experience with but one or, at most, a few of the various makes. I have had experience with quite a number of spoke augers and, like Mr. Harris, find that the A. A. Wood & Son's Universal Hollow auger is a very excellent tool. The Swan Universal Hollow auger is another very good one. I have both, using the Woods' power with a bit brace, and have the Swan fitted with a round shank for the machine. JOHN H. ROSE.

**Sharpening Chisels.**—I wonder how many smiths can draw a chisel down so that a really good tool is the result? Generally we find chisels sharpened as shown



A BETTER WAY TO SHARPEN CHISELS

at A. I find, however, that a chisel sharpened as at B is much better. It will stand more use with a curved cutting edge, as the corners will not break off so easily as when square. W. J. BARNES.

**An Iowa Price-list.**—As I have not seen any prices from this part of the country you readers will undoubtedly be interested in this list.

Shoeing Stallions, per shoe.....	\$1.00
Special Shoes, each.....	.50
Resetting old shoes, per set of 4.....	.80
New Shoes, per set of 4.....	1.60
Wagon and buggy tongues.....	2.25
Wagon Axles.....	2.50
Bolsters.....	1.25
Spokes.....	.15
Felloes.....	.20
New Plow Lays.....	3.50 to 4.00
Cutting down an old wagon.....	7.00
Setting wagon tires, per set.....	1.60
Setting buggy tires.....	2.00
Sharpening plows.....	.25
Sharpening shovels, per set.....	.50
Pointing plows.....	1.00
Pointing shovels, per set.....	2.00 to 2.25
Sharpening discs.....	2.00

Our other work is in proportion to the above prices.

My equipment consists of a three horse-power International engine, an emery wheel, power drill, disc sharpener, power blower, wood turning lathe and a feed grinder. I think the smith who runs a general shop without power is a back number. The "trade getter" is the man who keeps abreast of the times. I believe in doing good work and charging proper prices for it. The smith deserves them. C. A. MALMBERG.

**Several Questions are Asked.**—I have a few questions to ask the readers of THE AMERICAN BLACKSMITH concerning steel. Most of these questions are practical and I trust that I have made myself clear.

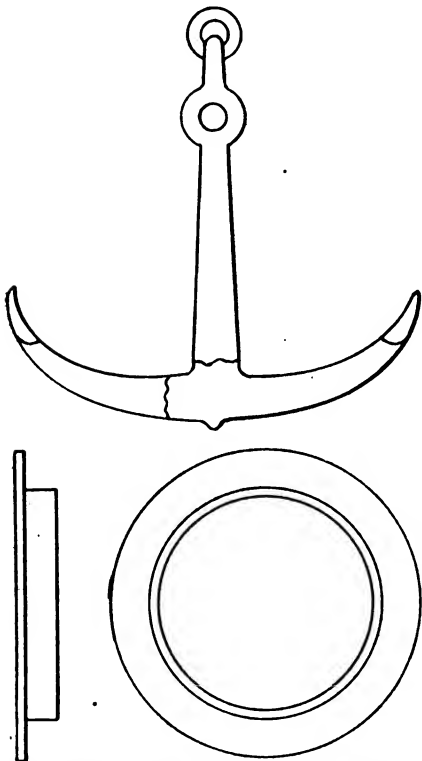
What goes out of steel when you hammer it, or what goes into it? Take a spring for instance—you hammer it out and put it in the shape and position you desire. Properly speaking it is not now a spring but a bit of cold steel and a slight pressure will put it out of position, but the smith knows how to proceed. He heats it to a certain degree, his experienced eye being the thermometer. He then cools it and still it is not a spring, but a piece of metal as brittle as clay. Should he happen to let it fall, it would probably fly into many pieces. What has changed it? He knows from practical experience that the change will take place, but has the smith ever asked himself the question which I ask? The next thing he is likely to do is to dip it into oil and to move it slowly over a fire until all the oil has been burned off and the metal shows a gray color. He now cools it in water and its condition is such as to make it almost unbreakable even by striking it with a hammer. The question comes up again, why is this so? Has something gone out of the steel and into the fire or into the water, or has something come from the fire and gone into the steel? Has the steel absorbed anything from the water to alter its makeup? Kindly think over these questions, brother smiths, and let us have some good practical answers expressed as clearly as possible. WM. KIRKPATRICK.

**How to Shoe a Stumbling Horse.**—In reply to Mr. Sam S. Stokes: It depends upon the cause of the trouble. If the cause be defective shoeing, the remedy is simple, but when the stumbling results, as it often does, from pain in the feet or legs, the remedy may be a difficult problem. Among the common causes of stumbling are—an inflamed condition of the feet, resulting from high feeding and severe work on hard roads, corns, contraction, thrush, side-bones, ringbone, splints, sore shins, an inflamed condition of the flexor tendons, navicular disease, or any defect which causes pain to the foot or limb, even as high as the shoulder, thus interfering with free locomotion, an impediment to the proper flexing of the limbs, in consequence of which the feet move too near the ground, the toes striking projections in the road which the feet would clear if the action were good. Observe a man with good, sound feet; he walks in a fair "heel and toe" fashion, bending the instep and raising the toes well from the ground at each step, while the man with feet tender from corns simply hobbles along, moving the feet so near to the ground that he encounters small obstacles and stubs his toes.

So, Brother Stokes, the first thing is to try to ascertain the cause of the trouble. If your horse has corns, they must be treated. If the feet are hot, dry and tender—rest, poultices and a laxative diet is the remedy. If he be developing some bony growth, the advice of a veterinary surgeon may be necessary. If the flexor tendons are sore, relieve them by elevating the heels of the feet with heel calks. If your horse has once been down on his knees, the case is aggra-

vated, because the knees, being bruised, the animal is afraid of bending them freely because it hurts, and the want of knee action greatly increases the liability to the accident. The roller motion shoe is all right, but if the trouble results from pain in the feet or limbs, you will have very little success until the cause is removed; therefore try to ascertain the cause and if you can discover it, remove it if possible and your efforts will be crowned with success. E. W. PERRIN.

**A Number of Questions.**—Can some brother inform us how to forge an anchor? Also tell us the best method of repairing an anchor when broken as shown in the engraving. Another thing we would like to know is, the best method of welding an angle iron ring with the flange on the outside as shown in the illustration. We would also like to know a simple method of calculating stock. For instance, you had to upset a piece of 4-inch rod and make a flange 6½ inches in diameter and three inches thick. How much of the 4-inch round



TO REPAIR THE ANCHOR AND FORGE THE RING OF ANGLE IRON

stock would be required to make that flange? Of course, we know decimals present the best way to work it out, but is there not a simpler way to figure it, so that it will come nearer the mark as there is always a little allowed for turning or cleaning up?

We are both young men, (25 years of age), have worked in quite a few locomotive and machine shops but have lots to learn. We, of course, have our opinion of getting at these jobs, but should like the opinion of other men, as we are always willing to learn. BEWLEY & STOCKER.

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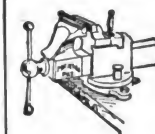
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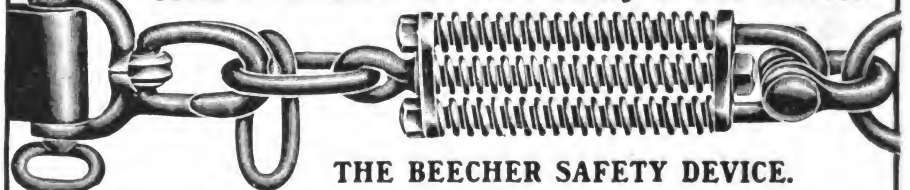


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"DUPLEX" DIE STOCKS.

two or three besides, because of their wide adjustability, thus covering several over sizes and a little under size.

Manufactured by

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50 Wood Street,  
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DUPLEX

DUPLEX

## BLACKSMITHS' HOOK and HANDLE



## RULE

Made from hard rolled sheet brass one-tenth in. thick, one and one-sixteenth in. wide, with heavy graduations and figures, graduated from the end in sixteenths of an inch on one side and from the inside of the hook in sixteenths of an inch on the other, adapting them for taking correct measurements from either the outside edge of a hot piece of iron, or from the inside when held against a corner. Graduated twelve inches, have flat handles and measure over all  $16\frac{3}{4}$  inches.

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Quick-Acting, Self-Locking.

Every size and shape used in the wood and metal working trades.



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Bloomfield, N. J.

"TOOLS THAT WEAR"

## HELLER'S CELEBRATED AMERICAN HORSE RASPS, FILES AND FARRIER'S TOOLS

will save you Time and Money. Their Superior Quality sets a known and tested Standard of Excellence. All made from our own Production of Special Refined Gray Crucible Steel and Tempered by a Secret Process.



HORSE RASP.

New Catalogue Mailed Free on Application.

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That's why the

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is sold, and its merits recognized in nearly every country of the globe.

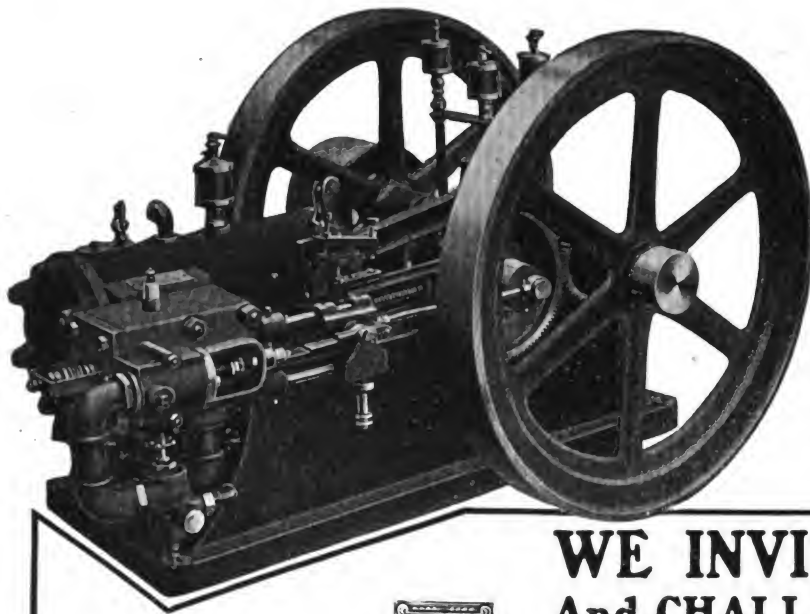
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ELECTRIC  
BATTERY CO.,  
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Ohio.

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Sales Office,  
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2 to 25 Horse Power.

*Always Ready to Start.*

*No Engineer Required.*

*No Increase in Insurance  
by their use.*

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#### OUR "GIANT"

#### 4 H. P. Engine

The Best on the Market  
for the user of small  
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WILLIAMSPORT ENGINES are constructed by the most skilled workmen, and only the very best material used. We offer you an Engine of the Finest Quality, noted for its Simplicity, Durability, Ease of Operation and Beauty of Design. Our broad Guarantee covers all.

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**Williamsport Gas Engine Co.**

WILLIAMSPORT, PENNA.

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### MERRIMAN Standard BOLT CUTTER

Has more special features than any other machine of its kind.

Among these great characteristics are: 1. Simplicity of the head; 2. Durability of all parts;

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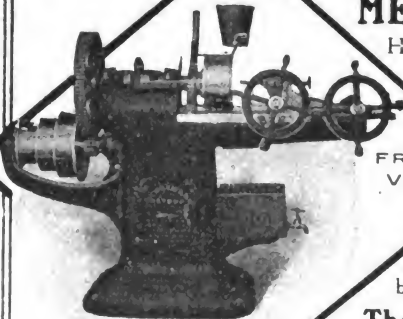
Solidity of dies like solid die;

5. Consequent uniformity of

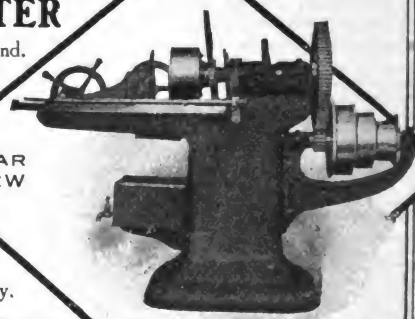
product; 6. Effectiveness of operation, very simple in construction. Get

our descriptive circulars and complete catalogue of bolt and nut machinery. Free to you. Write today.

The H. B. BROWN CO., East Hampton, Conn.



FRONT  
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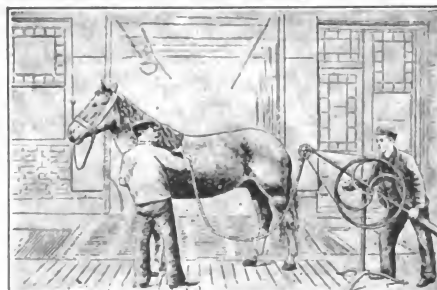


REAR  
VIEW

## The Celebrated Gillette Horse Clipping Machines

The Guarantee we give you with our Machine is as good as a U. S. Gold Bond.

We are so far in advance of other Machines in improvements that we really have no competitors. Gillette Machines give satisfaction in every way.



Our claim is as broad as words can make it. The Gillette Clipping Machine is better than any other Clipping Machine in every particular.

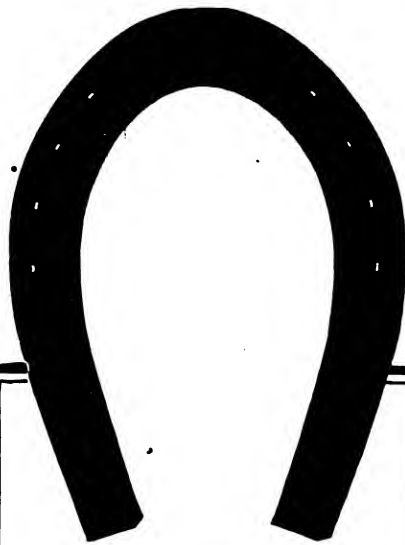
The Gillette Machines were the first Horse-Clipping Machines made in any part of the world; many imitations have been put on the market, but none have ever reached our high standard.

Write us for our Catalogue.

**THE GILLETTE CLIPPING MACHINE CO.,**

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Is it not preferable to make your selection from the most complete line and the best shoes on the market?

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"In a Class by Themselves"

OUR Illustrated Catalogue shows all sizes and patterns. The book is free. We will gladly send a copy to your address. Write today

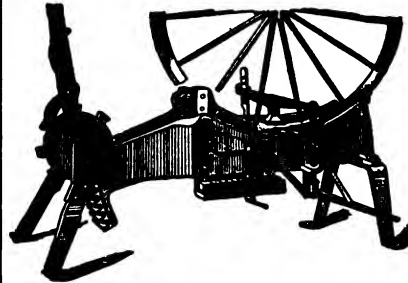
We are giving away a handsome souvenir stick pin to every smith who sends his name and address. Did you get one? Don't wait until they are gone. Write today.

UNITED STATES HORSE SHOES  
— ARE SOLD BY —  
LEADING JOBBERS  
EVERYWHERE

## United States Horse Shoe Co.

ROLLING MILLS  
and FACTORY  
Erie, Pa.

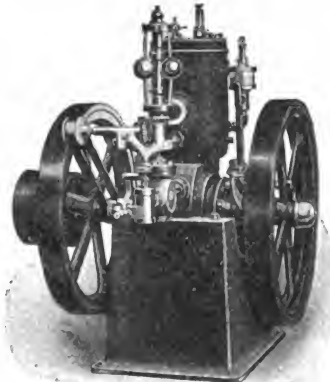
## HOUSE COLD TIRE SETTER



Nearly 3,000 have been sold, none of them broken up or abandoned, but are all in use today. Don't be deceived into buying anything else. The above proves that ours is the only successful Cold Tire Setter in the world. Write us for catalogue and prices. Free to you. Send today.

HOUSE COLD TIRE SETTER CO.,  
Office and Factory, 216-220 So. Third St.,  
ST. LOUIS, MO.

## FAIRFIELD ENGINES



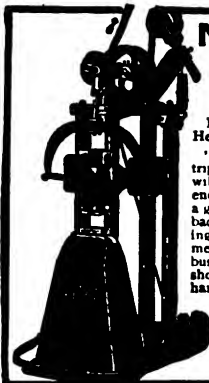
In quality of material and workmanship, simplicity of construction, ease of handling and economy of fuel, the FAIRFIELD has no superior. The stationary engine, illustrated, has a pedestal base, two large spoke wheels, and is provided with a ball governor that controls perfectly the amount of gas necessary to control the speed on any variation of load. It is light and compact and an ideal portable engine. Made either with jump or make and break spark, in 2, 3, 4½ and 6 H.P.

PRICES \$95.00 TO \$200.00.

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THE FAIRFIELD MOTOR CO.  
FAIRFIELD, CONN.

## NOVELTY IRON WORKS BOSS HAMMER



For Plow Work, Wagon Work, Heavy Work, Any Work.

"We have been using your Boss trip hammer for over a year and will say that to do without it would end the business for us as we have a great deal of plow work and to go back to the old method of drawing out a share would discourage me so much that I would quit the business. Any man having power should by all means have a Boss hammer." H. J. DURBS & SON, Ransom, Kas.

G. E. DAVIS, Mgr.,  
DUBUQUE, IOWA.

For  
Gas or Gasoline

Sizes  
2½ to 30 H. P.



## Greendale Gas Engines.

THE BEST POWER  
For Blacksmith Shops.  
Also adopted for Electric  
Lighting.

Write for Catalogue A. B.  
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WORCESTER, MASS.

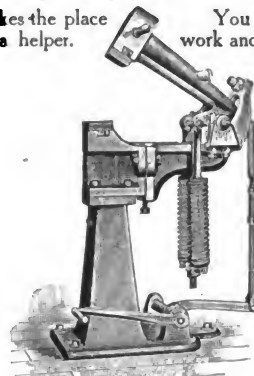
## LIGHTEN YOUR LABORS

BY USING A

## STANDISH FOOT-POWER HAMMER.

Takes the place  
of a helper.

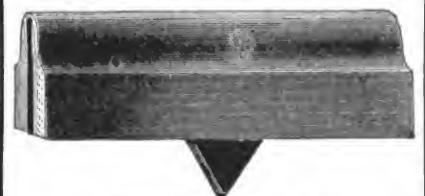
You can do more  
work and better work.



Our Power Hammers give perfect satisfaction wherever used and they are doing good work in the best shops in the country. Drop us a card and we will send you interesting descriptive circulars free. Write at once—today.

The Standish Machine & Supply Co.,  
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Patented Aug. 8, 1906.

Will weld together and on any shoe with one heat. Center section will harden perfectly at cherry heat in slack tub. Write for information to

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COUNCIL BLUFFS, IOWA.

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alcohol engine, superior to any one-cylinder engine; revolutionizing power. Its weight and bulk are half that of single cylinder engines, with greater durability. Costs less to Buy—Less to Run. Quickly, easily started. Vibration practically overcome. Cheaply mounted on any wagon. It is a combination portable, stationary or traction engine. SEND FOR CATALOGUE. **THE TEMPLE PUMP CO., Mfrs., Meagher and 15th Sts., Chicago.** THIS IS OUR FIFTY-THIRD YEAR.

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Gasengine ignition is made sure by the **APPLE AUTOMATIC SPARKER**. It "gets" all possible power out of every explosion because its sparks give off heat and explode an entire charge at an instant. No switches, no bells, no batteries.

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A low wagon at a low price. Handy for the farmer. Will carry a load anywhere a horse can travel.

## Low Down Wagons

soon earn their cost on any farm.

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for farm wagons. Straight or staggered spokes. Any size wanted, any width of tire. Hubs to fit any axle. For catalogue and prices, write to **Empire Mfg. Co., Box 300, Quincy, Ill.**



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Invest in some good books and then judge for yourself if it doesn't pay. Their pages tell you how to do many a difficult job. You cannot afford to be without these:

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A most valuable treatise upon forge work by John L. Bacon. The book is profusely illustrated and contains chapters on welding, upsetting, drawing out, bending, metallurgy and calculation of stock, also tables and formulas. It has over 250 pages and is very neatly bound in red cloth. Price, \$1.50

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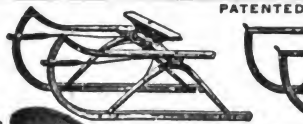
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Any of the above books will be sent postage prepaid upon receipt of price.

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For farm, road and lumbering Bobs.  
Sizes, 1½, 1¾, 2, 2½, 3, x 3½ in. runners. Satisfaction Sure. Try Sample Set.



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For Pleasure, Delivery, Express, Sleigh, etc.

The Strongest, Neatest, and Best.

**Sherwood Hall Co., Ltd., 24-28 IONIA ST.,**

## THIS is the Brown Oscillating Sleigh Knee.

Needs No Recommendation. Satisfaction Guaranteed.

Sizes, 1¼, 1½, 1¾, 2, 2½, 3 and 3½.

Write for circular and prices on our complete line of sleigh goods.



**GRAND RAPIDS, MICH.**

# STANDARD —IN THREE— RESPECTS

We have called to your attention a number of times the three principal requirements for a **SOLID BOX VISE** of highest quality.

**FIRST—The width of the jaws.**

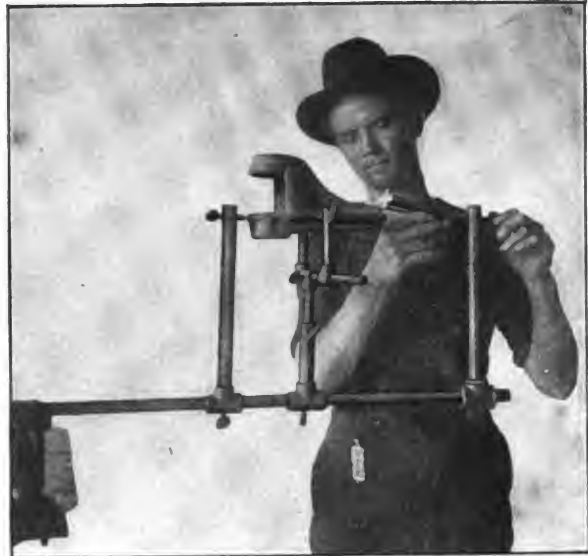
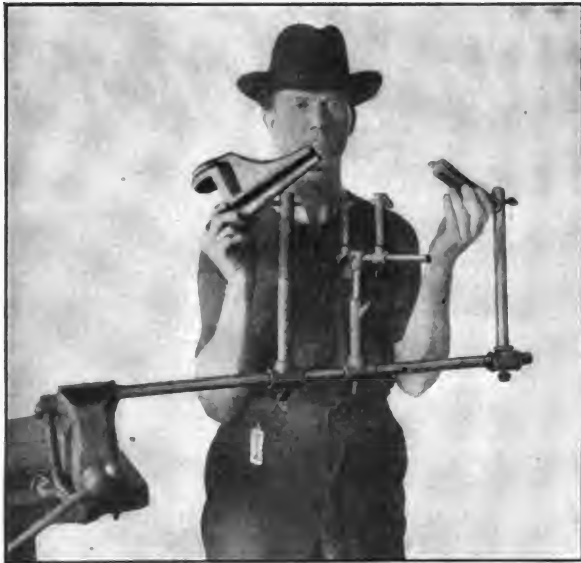
**SECOND—Distance vise opens.**

**THIRD—Weight of vise.**

The "Columbian" is standard in these three respects: the jaws are wider -- vise opens wider -- it is *never* under weight.

Write for our catalogue No. 16 and compare the dimensions given there with any other solid box vise, and see for yourself which one is *standard*. It includes a complete list of solid box, machinist and coachmakers vises; also tells about Columbian All Steel Anvils. Sent free to any address. Very interesting and educational.

**THE COLUMBIAN HARDWARE CO.**  
MANUFACTURERS  
CLEVELAND, OHIO, U. S. A.



## WHAT IS A BRAZING COMPOUND WITHOUT SOMETHING WITH WHICH TO HOLD YOUR WORK

Nearly as bad as a wagon without a tongue. You have had experience and know. It's hardly necessary to tell you again but it's so true that you cannot braze one-third the castings that you would like to braze, that we cannot help saying so for fear that you may have never bought any Brazing Compound and think when you get the compound you have the brazing problem solved. It is not so, your troubles have just begun. No compound will hold the work and it has to be held. The photographs here show a casting that weighed 10 lbs. that was brazed in ten minutes. He got one dollar for that piece of work. The customer saved two days time, twenty-five cents telephone, forty cents expressage. The casting would have cost two dollars. The Blacksmith made a Dollar and a friend too, all done by owning a "LONE STAR BRAZING HOLDER" about the simplest device imaginable but the most practical. It will hold most any odd shaped casting, circular, half-circle, zig zag, it's adjustable to any kind. This tool is so simple and does its work so well you will say when you have seen and tried one, "Now why didn't I think of this." We did though and patented it. We sell the Holder Complete with Compound for \$10.00, Holder only \$6.00. Compound only \$4.00, charges paid when the money is remitted with the order. We will send any reliable Smith a Holder and the Compound on trial on receipt of two dollars and if it will not do what we say it will you can express it back. We have experimented with the various compounds and know that the LONE STAR (which is patented), will do the work in a way which no other will.

One Blacksmith writes: "Your Brazing Holder and Compound is all you claim for it. All the work I have done with it is much better than it was before it was broken. Every Blacksmith should have one." Another one says, "The outfit is more than you claim for it. Enclosed find check for \$10.00." Still another comes back like this, "It's just the thing that every Smith needs and I heartily recommend both the Holder and Compound to my fellow craftsmen. I find the compound far excels anything of the kind I have ever used." We send everything prepaid on receipt of the price and you can express back to us C. O. D. if it is not just what we say.

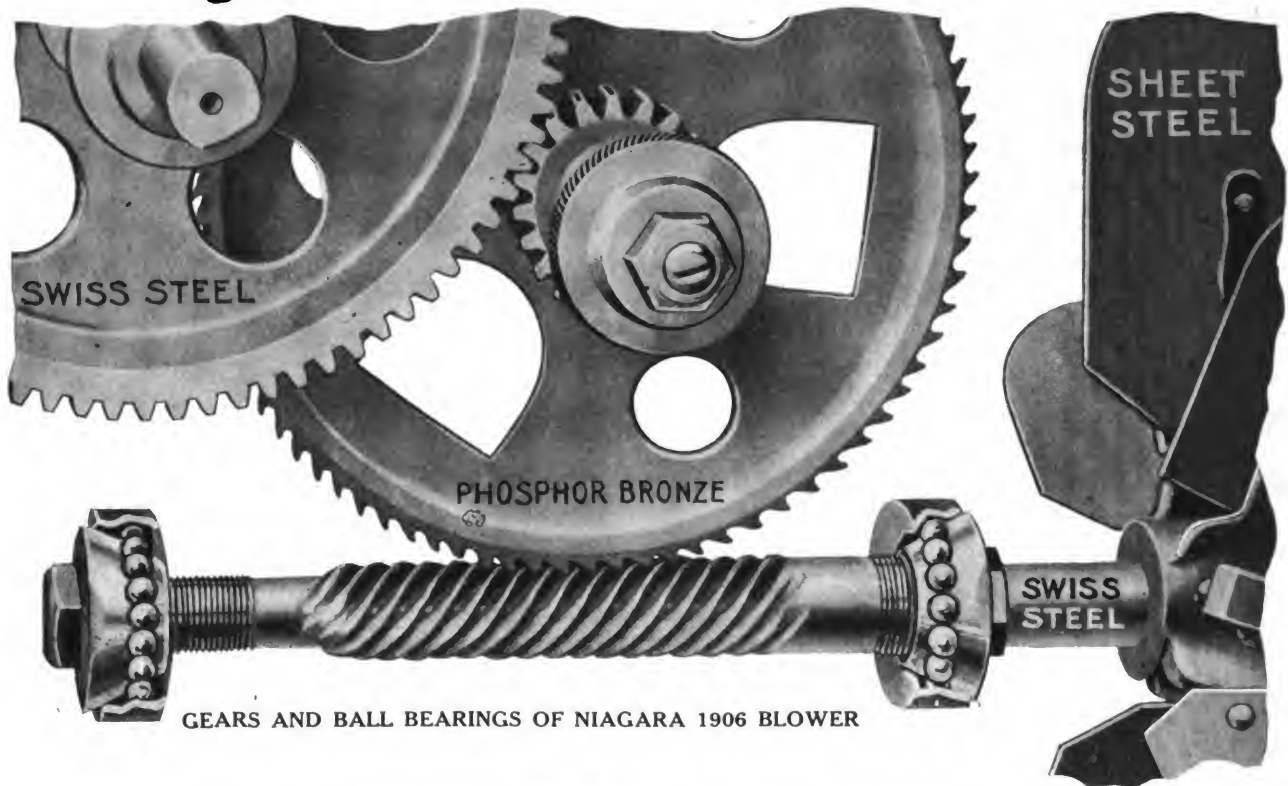
## THE LONE STAR BRAZING CO.,

MANUFACTURERS LONE STAR BRAZING HOLDER AND COMPOUND,

FORT WORTH, TEX.



# Niagara 1906 Blower



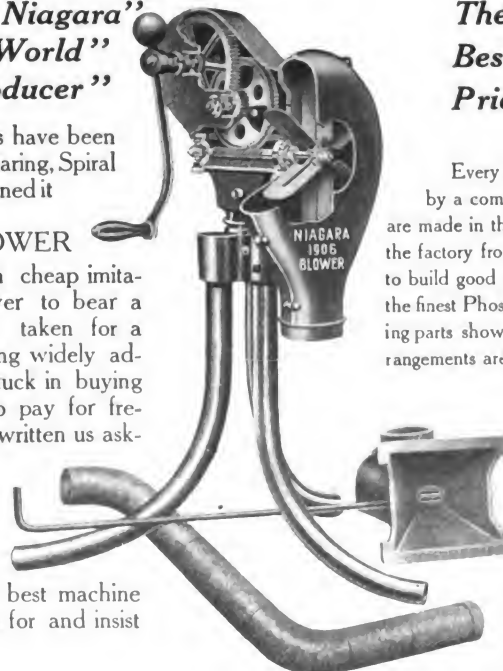
GEARS AND BALL BEARINGS OF NIAGARA 1906 BLOWER

***"Like The Noble Grand Niagara"***  
***"The Wonder Of The World"***  
***"The Great Power Producer"***

So many similar commendations have been received from users of our Ball Bearing, Spiral Shaft Blower that we have christened it anew

## NIAGARA 1906 BLOWER

so as not to confuse buyers with cheap imitations. This is too good a blower to bear a name or number that might be taken for a cheap, inferior machine now being widely advertised. Those who have got stuck in buying the wrong Blower have had to pay for frequent repairs. Many such have written us asking if we will build them a set of gears that will not cause such trouble. Therefore we have renamed our wonderful Ball Bearing Blower so as to insure and protect all buyers getting the best machine on the market, in the future. Ask for and insist on having Niagara 1906.



***The New Niagara 1906 Blower***  
***Best In The World***  
***Price Lowest Of Any***

Every user of a Niagara 1906 Blower is protected fully by a company financially responsible. The Niagara gears are made in the largest and best equipped factory in the world—the factory from which all others have endeavored to learn how to build good work. In the Niagara Gears and Bearings, only the finest Phosphor Bronze and Swiss Steel are used. The working parts show as fine workmanship as a watch. The oiling arrangements are perfect and absolutely eliminate friction and wear.

The blast is equally strong when handle is turned in either direction. Each and every Niagara 1906 Blower is furnished with our new center and side blast tuyere which is positively the best of its kind on the market. Your dealer will quote you a lower price on Niagara 1906 Blower than he can quote you on any other geared hand blower on the market. Notify us of any similar Blower selling at lower price. Send for new illustrated Catalog of Blacksmith Tools. Just out.

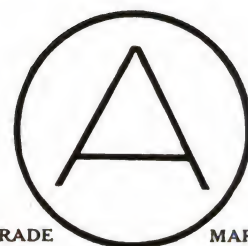
## Lancaster Forge & Blower Co. Buffalo, N.Y.





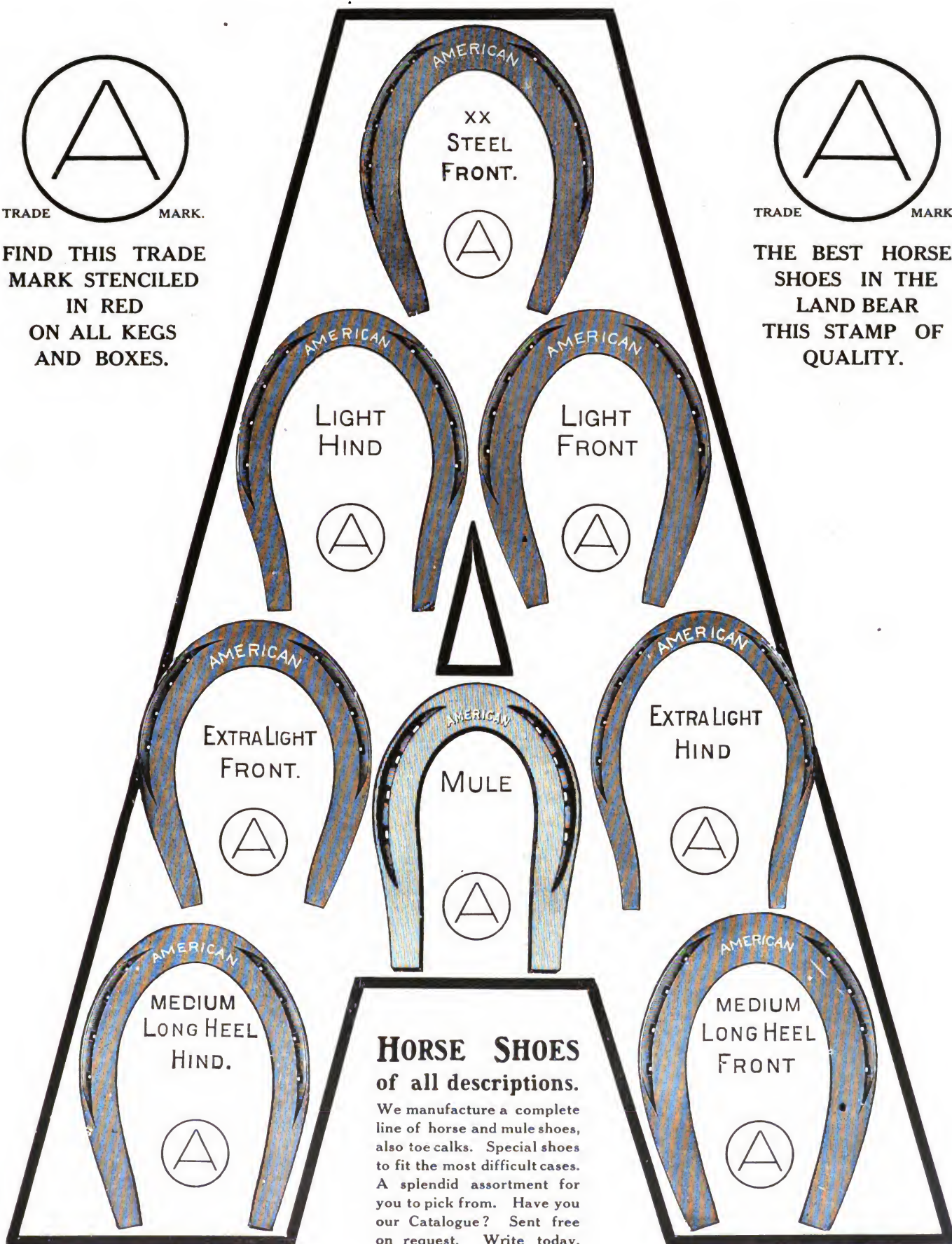
TRADE MARK.

FIND THIS TRADE  
MARK STENCILED  
IN RED  
ON ALL KEGS  
AND BOXES.



TRADE MARK.

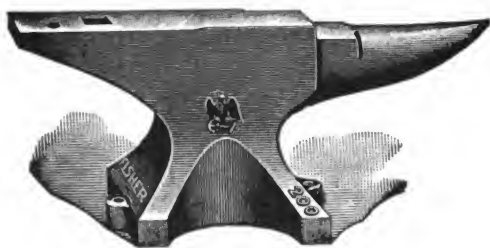
THE BEST HORSE  
SHOES IN THE  
LAND BEAR  
THIS STAMP OF  
QUALITY.



### HORSE SHOES of all descriptions.

We manufacture a complete line of horse and mule shoes, also toe calks. Special shoes to fit the most difficult cases. A splendid assortment for you to pick from. Have you our Catalogue? Sent free on request. Write today.

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PHILLIPSBURG, NEW JERSEY.

**"EAGLE"****ANVILS.**

1843

1906

**WE BELONG TO NO TRUST--one blow on an "Eagle" anvil is worth two on any other anvil MADE**

The Face Consists of a Single Piece of the Very Best Cast Steel Perfectly Welded and of the Hardest Temper. The Horn is made of Tough Untempered Steel and will neither Break nor Bend. All "Eagle" Anvils made with the Latest Fisher Patent Double Thick Steel on Both Edges of the Face. Made in all Shapes and Sizes up to 1300 lbs. Weight.

WRITE FOR INTERESTING CIRCULARS AND PRICE LIST. SENT FREE.

**EAGLE ANVIL WORKS, TRENTON, NEW JERSEY.**

**PIONEERS**

IN THE MANUFACTURE OF

**ANVILS AND VISES OF QUALITY****"Fisher" Double Screw Parallel Leg Vise**

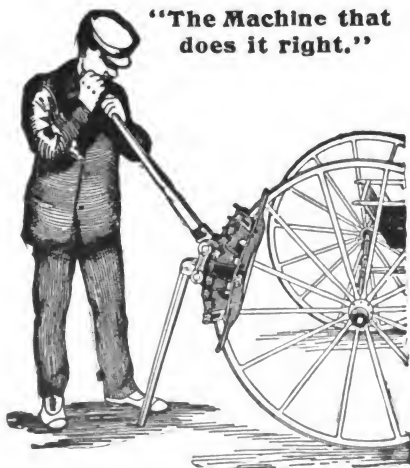
Is sold by Reliable Dealers Everywhere. For Strength and Durability there are none better made. The "FISHER" is acknowledged the Best for Blacksmiths.

We have had over sixty years Experience in this line and offer you the most reliable Anvils on the Market. Every one Guaranteed.



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"The Machine that does it right."



3,000  
in use  
in the  
United  
States  
and  
Canada

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In use in all modern shoeing establishments, because they fill every shop requirement and give satisfaction everywhere.

Every one fully guaranteed. All the objectionable features of the cheap stocks eliminated.

### BARCUS STOCKS

are simple, strong, solid, safe and sure to hold. No ropes or pulleys to tangle or break; no bracing to roof or floor, but furnished complete ready to bolt to the stationary posts in your shop. You can rely on

**Barcus Stocks Every Time.**

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MR. GEORGE BARCUS:—I wish to say that the horse rack we bought of you gives perfect satisfaction in all respects.  
Yours respt., HODGINS & DOUGLASS.

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Yours truly, MARTIN DUNDON.

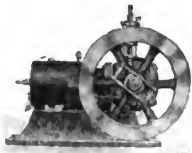
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**GEO. BARCUS & CO.,**

Box 61,

Wabash, Ind.





The 1906  
**CUSHMAN**  
3 H. P. 150 lbs.  
6 H. P. 225 lbs.  
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Free Catalogue.  
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ARE THE THINGS FOR BLACKSMITHS

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**9 to 15 in. Swing. New Features.**

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Catalogue Free. Sizes 9, 10, 13, 15 inches.

Our engine lathes are provided with both screw and rod feeds as well as power cross feed. Gears to cut all standard threads from 5 to 36 are furnished. Steady and follower rests, large and small face plates and countershaft go with each Lathe. Foot Lathes, Tools and Supplies.

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**TOP BUGGY, \$29.00.**

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We make hand power benders for forming eyes from stock 1 3/8 inch thick and under. Any size eye 7 inches outside diameter and under.

**WALLACE SUPPLY CO.,**  
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MADE IN ALL SIZES.

Built especially for **Blacksmith shop** power. It means money in your pocket to find out about our engines before placing your order.

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Our Blacksmith's Special  
3 1/2 to 4 H. P.

**GASOLINE ENGINE**

The Engine Is Right!  
The Price Is Right!

Investigate the **WATERLOO** before placing your order.

**WATERLOO GASOLINE ENGINE CO.**  
WATERLOO, IOWA

**Blue Chip Steel**

Will turn off blue chips on any kind of work.

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¶ with a "JACK of ALL TRADES" outfit you can accomplish more and better work in less time, save yourself trouble and the expense of a helper.

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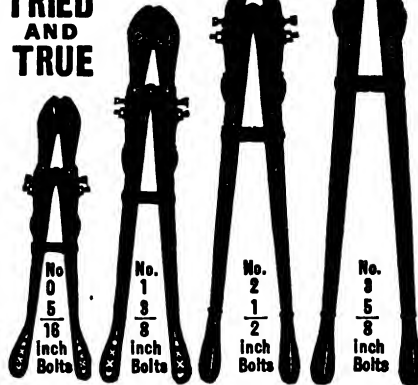
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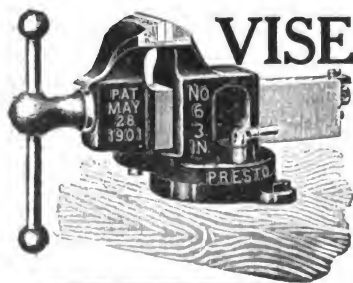
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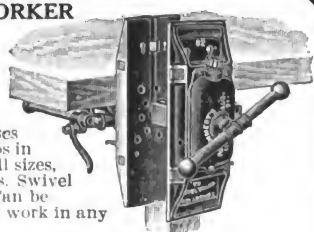
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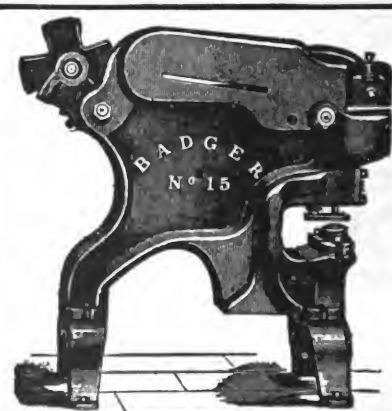
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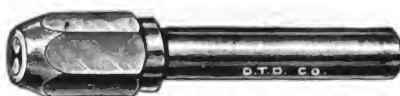
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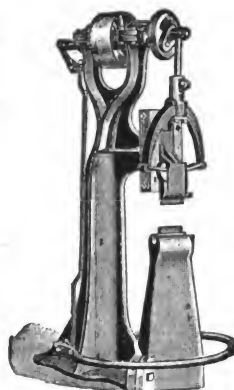
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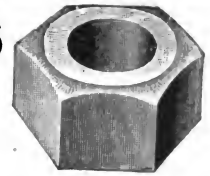
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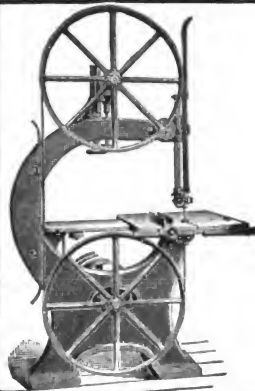
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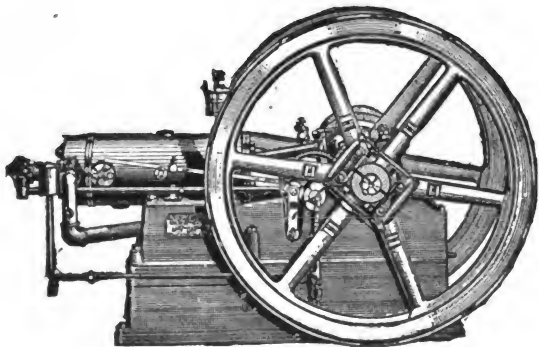
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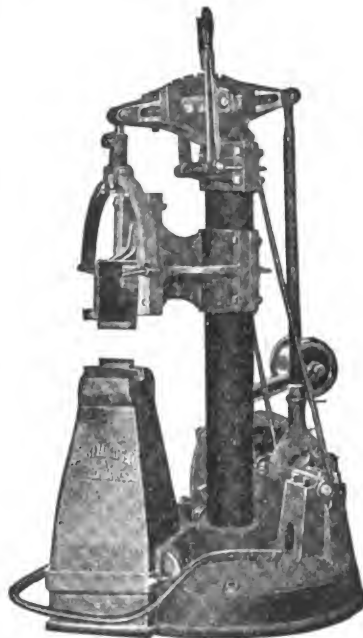
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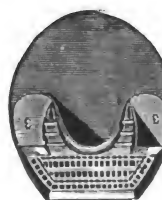
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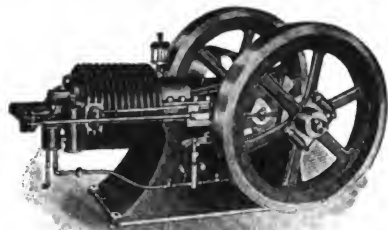
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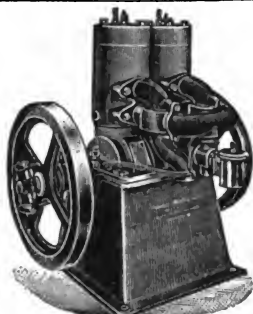
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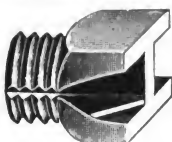
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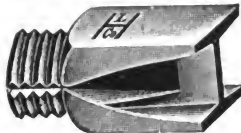
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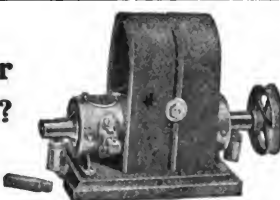
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DRILL CHUCK**

Made entirely of steel, especially for blacksmithing and carriage work. Positive, strong and self-cleaning. Casts no shadows. Will save cost over other chucks in the saving of time. Money refunded if not as represented. Ask your jobber for it or send direct for prices and circulars. The test is the cheapest. The Oneida National Chuck Co., Oneida, N.Y., U.S.A.

**ZIEGLER NECKYOKE CENTERS**

the only practical lock neckyoke on the market. None better for safety and durability. Very handy for repair work. Have you tried them? Ask your jobber for them.

Descriptive circulars free.

**THE ZIEGLER NECKYOKE CO., Coffeyville, Kas.**

**ECLIPSE  
GAS AND GASOLINE ENGINES.**

Vertical 2, 3, 4, 5, H. P.  
Horizontal 5, 10, 12, 15, 20, 25, H. P.

Designed and Built for BUSINESS.  
Catalogue on request.

**MYRICK MACHINE CO., Olean, N.Y.**

**MIETZ & WEISS  
KEROSENE ENGINES**

GAS AND OIL, 1 1/2 to 70 H. P.  
Safe, Reliable, Economical.  
Send for Catalogue.

**A. MIETZ.**  
128-138 Mott St., New York.

**THE ENGINE YOU NEED!**

**BALANCE WHEELS TURNED TRUE.**

Look at the Picture Carefully.

Simplicity and Perfection in Design can be seen at a glance. Lubrication is Reliable and this you know is a **VITAL POINT.**

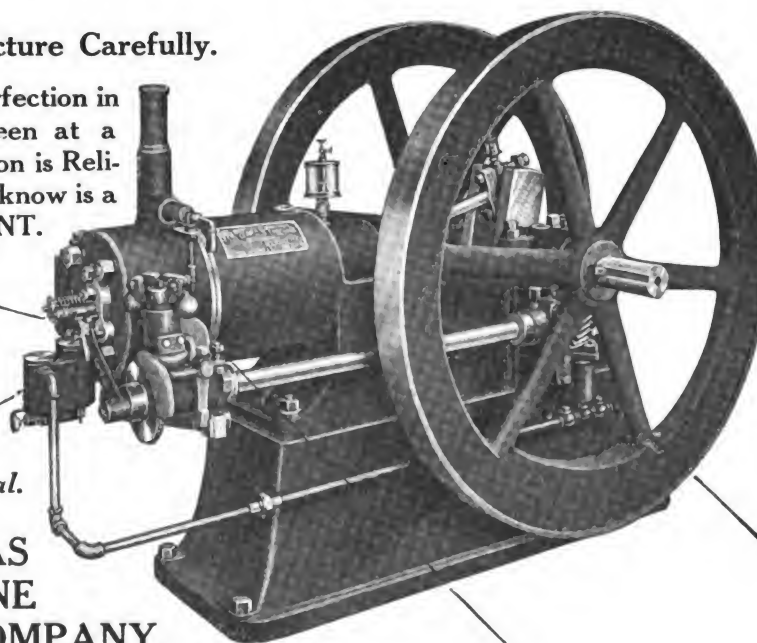
Electric Spark

Weber Patent  
Vapor Mixer.

Bearings are  
Frictionless Metal.

**WEBER GAS  
& GASOLINE  
ENGINE COMPANY,**

BOX 400, KANSAS CITY, MO.  
Catalogue Free.



COMANCHE, Tex., Mar. 21, '06.  
Gentlemen:

We have been using one of your 6 H.P. Weber engines for eighteen months, driving a power blacksmith shop. We run a trip hammer, band saw, a 14 in. circle saw, an emery stand with two stones, a 14 in. rock, and one 10 in. rock, one turning lathe, 12 ft. bed, one large drill press, three fires, one 14 in. fan and wood lathe. We hitch all this machinery on at one time and have a surplus of power, enough to pull this machinery more. This engine is the simplest to operate I have ever seen. There are ten Gasoline engines in our town, mostly Webers. My brother has just completed a power shop ready for work, which he will operate with a 6 H.P. Weber engine.

Yours very truly,  
STAFF BROS. & CLARK.

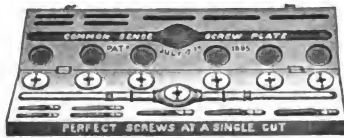
*This Gasoline Pump  
Reduces Cost of  
Insurance.*

Your Fingers will turn GOVERNOR NUT to adjust SPEED, and you  
**DO NOT NEED TO STOP ENGINE.**



**SPAVINOFF CURES**  
 Spavin, Ringbone, Grease Heel, Sweeney, Windgall, Enlargement, Curb, Galls, Sores, Pollevil, Scratches, Shoe Bolls, &c. Removes unnatural growths and lameness, leaving flesh smooth and clean. Testimonials.

CHURCH BROS., AFTON, N. Y.  
 \$1.00 per Box, by Mail. FOR HORSES AND CATTLE.



## A GUARANTEE

goes with all our tools, screw plates, taps and reamers. Ask your dealer for them. If he can't supply you, write for catalog and price list.

W. L. BRUBAKER & BRO.  
 MILLERSBURG, PA.



## THE MAN WHO KNOWS

the good and the bad points of all typewriters buys the

## Remington

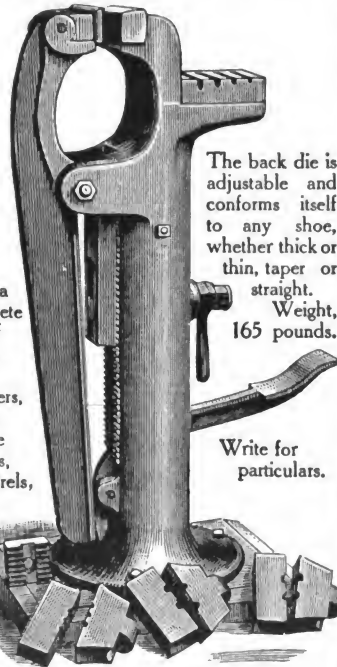
Remington Typewriter Co.  
 327 Broadway, New York

## Little Giant.

### A SIGN OF Strength and Quality

#### Foot Vise and Bolt Header

Simple, Strong, Solid and Durable. For Forming, Sharpening and Welding Calks on Shoes. For making bolts and bending and shaping hot iron.



We carry a complete line of Drills, Bolt Headers, Vises, Swage Blocks, Mandrels, Etc.

The back die is adjustable and conforms itself to any shoe, whether thick or thin, taper or straight. Weight, 165 pounds.

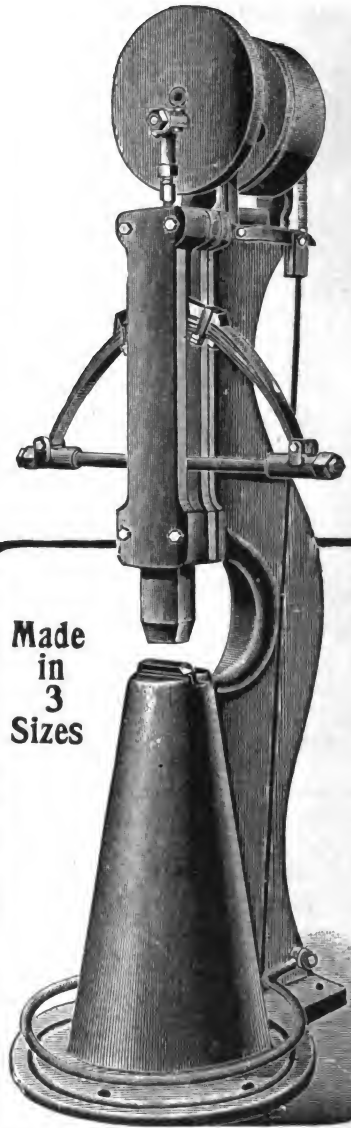
Write for particulars.

Our Complete Catalogue is Free. Fully Illustrated.

Write Today.

## B. B. NOYES & CO.

Greenfield, Mass., U. S. A.



Made in 3 Sizes

### The Perfect Power Hammer

has no equal for simplicity and efficiency. Does a wide range of work from the lightest forging to heavy axle welding. Note the long guides, insuring a direct vertical stroke. No side motion. Easy to operate from the lightest tap to the heaviest blow. The Disk Attachment free. No other Hammer has this advantage. It only requires one Horse Power to run it. Write for prices.

Macgowan & Finigan Foundry & Machine Co.  
 ST. LOUIS, MO.

# DON'T BUY AN ANVIL

UNTIL YOUR DEALER HAS SHOWN

YOU THE

# TRENTON

## IT SPEAKS FOR ITSELF

## S. N. BROWN & CO.

DAYTON, O.  
—MANUFACTURERS OF—  
Vehicle and Automobile Bows

### DEATH TO HEAVES! NEWTON'S

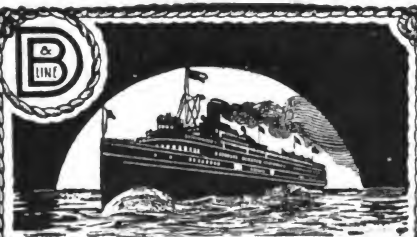
**GUARANTEED**  
Heave, Cough, Distemper and Indigestion Cure will effect a permanent cure for the ailments named. Recommended by veterinarians and owners. Every druggist in America has it or can get it.  
Send for Booklet.  
\$1.00 per can, of dealers, or express prepaid.  
THE NEWTON REMEDY CO., TOLEDO, OHIO.

### Ball Bearing MACHINERY.

Rip Saw, Band Saw, Boring and Spoke Tenoning Machine all in one. Each attachment ready for instant use, either for foot, hand or belt power.  
Write for circulars and price list.  
**PARKS**  
Ball Bearing Mach. Co.  
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### New Era Electric BLOWER

Direct connected, has been designed especially for the blacksmith and it is his ever ready helper that works for less than five cents a day. It places him on equal footing with the largest steam shops and allows him to work at the anvil steadily while electrically heating his work.  
Write for circular and particulars.  
NEW ERA ELECTRIC CO.,  
942 W. Lake St.  
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## Across Lake Erie —BETWEEN— TWILIGHT AND DAWN

The D. & B. Line Steamers leave Detroit weekdays at 5:00 p. m., Sundays at 4:00 p. m. (central time) and from Buffalo daily at 5:30 p. m. (eastern time) reaching their destination the next morning. Direct connections with early morning trains. Superior service and lowest rates between eastern and western states.

### Rail Tickets Available on Steamers

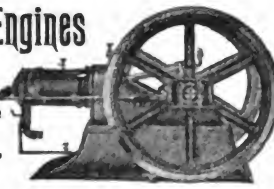
All classes of tickets sold reading via Michigan Central, Wabash and Grand Trunk railways between Detroit and Buffalo in either direction will be accepted for transportation on D. & B. Line Steamers.

Send two cent stamp for illustrated pamphlet. Address, A. A. Schantz, G. S. & P. T. M., Detroit, Mich.

**Detroit & Buffalo Steamboat Co.**

## Simplicity Engines

All Sizes  
Get our proposition.  
Western Malleable and Grey Iron  
Manufacturing Co.,  
8-20 Chase St.,  
MILWAUKEE, WIS.



### HIGH-GRADE BUGGIES

**\$47.50**  
AND UP.  
Dealers Only.



Strictly First-Class Material.

**JAMES & MEYER BUGGY CO.**  
Write for Catalog and Prices. Lawrenceburg, Ind.

## Read This Guarantee



The Goodson Igniter is guaranteed to produce a sufficient spark to start a gas or gasoline engine without batteries or spark coil.  
Send for Catalog.

**Goodson Electric Ignition Co.**  
95 Point Street,  
PROVIDENCE, R. I.

TIRE SHRINKER

TIRE BENDER

FOR PROGRESSIVE BLACKSMITHS

**IDEAL**

WRITE FOR DESCRIPTIVE CIRCULARS THE WEYBURN CO. ROCKFORD, ILL. U.S.A.

BLOW SHAPE AND OTHER STEEL SHAPES

BLANKSLEY TOYER IRON

## Badger

"The world's standard for efficiency"

### BADGER GASOLINE ENGINES Turn Time Into Money

Badger Engines enable the blacksmith to make the most money out of his time by enabling him to do more, better and a greater variety of work, and at the same time employ less help—saving cost of helpers.

The "Badger" stands for superior excellence and efficiency the world over.

Badger Engines are easy to start and to keep going; cost almost nothing for repairs and last a life-time. They are as cheap as is consistent with best skilled workmanship.

Send at once for our Fine Book, Illustrated in colors—It's FREE. It tells all about Badger Gasoline Engines, and why they are the best on earth for the Blacksmith. Write today, before the books are gone.

Special discount to Blacksmiths who take an agency.  
Write for attractive terms.

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IGNITING DYNAMOS  
Excel all others!

The only generator that cannot lose its magnetism. For either make and break or jump spark work. Also spark coils. Send for Catalogue B.

**The Knoblock-Heideman Mfg. Co.,**  
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### BUILT TO STAND

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A well-made, accurate machine; especially adapted to run by gasoline engine; capable of all kinds of band-sawing, particularly carriage repair work. These are a few of the fine points of Marston's Band Saw.

We will gladly send Prices and Circulars. Drop us a Card today.

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222 Ruggles St.,  
Boston, Mass., U.S.A.

## BEST ROUTE To the Northwest.

**Chicago, Milwaukee & St. Paul Railway**

In going to St. Paul, Minneapolis or the Northwest see that your ticket west of Chicago reads via The Pioneer Limited on the Chicago, Milwaukee & St. Paul Railway—the route over which your letters go. Standard and compartment sleepers with longer, higher and wider berths. Leaves Union Station, Chicago, 6.80 p. m. daily; arrives St. Paul next morning at 7.25 and Minneapolis at 8.00 o'clock.

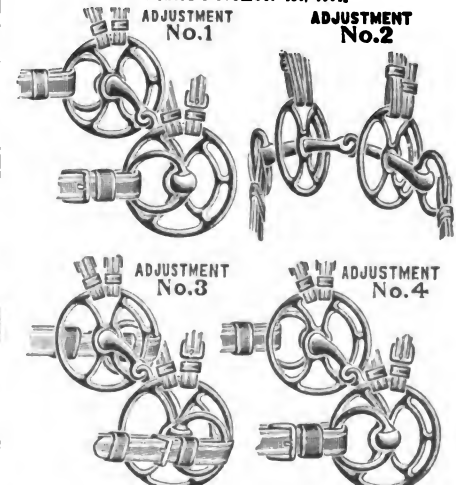
### GO NOW TO CALIFORNIA.

Via The Overland Limited on the Chicago, Milwaukee & St. Paul Railway. Less than three days en route. No change of cars. From Union Station, Chicago, at 8.00 p. m. daily. Descriptive folder free.

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General Passenger Agent, Chicago.

## FOUR IN ONE BEERY BIT

Patented November 1st, 1904.



The above cuts illustrate the four different adjustments, all made by changing the manner of fastening the lines. Bits sent on ten days' trial. **PROF. JESSE W. BEERY,** Pleasant Hill, Ohio





## Potters Spring Brake Blocks

For Vehicles of all kinds with STEEL OR RUBBER TIRE.  
Have a record of excellency for seventeen years. **0 0 0**

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SOLE MANUFACTURERS.

CATALOGUES.

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TWENTY-FIVE YEARS ACTIVE PRACTICE.

SPECIALTY: "Working on  
the Failures of Others."  
Rejected and difficult cases solicited.

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A wheel that will do the work  
in one-fourth to one-half less  
time is by far the cheapest  
in the long run. A wheel  
that will save only one  
hour per day during  
your busy season would  
pay for itself in full.



## "CHICAGO" WHEELS SAVE TIME

They're made  
of stuff that cuts

Emery Wheels, Glue, Emery, Pol-  
ishing Wheels, Grinding Machinery  
136 Page Catalogue for the Asking

*Chicago Wheel & Mfg Co*

42 W. RANDOLPH ST.  
CHICAGO, U. S. A.



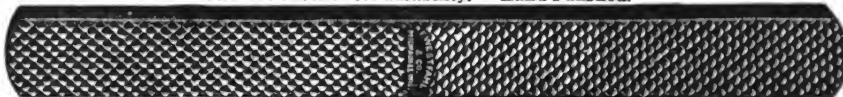
## HIGHEST GRADE

Ignition Generators do away with EXPENSE and TROUBLE of  
batteries. Can be easily installed with any engine and is very  
simple. This Magneto regulates its own speed and furnishes con-  
stant spark at all times. **INFORMATION ON REQUEST.**

**REMY ELECTRIC CO., ANDERSON, IND.**

## WESTFAHL (MILWAUKEE) RASPS

Can't be excelled for durability. "Hand Punched."



Our new 18 inch rasp. Round ends.  
Ask your dealer for the Westfahl brand. If he can't supply you write us your requirements  
Mention The American Blacksmith,  
**WESTFAHL & CO., Milwaukee, Wis.**

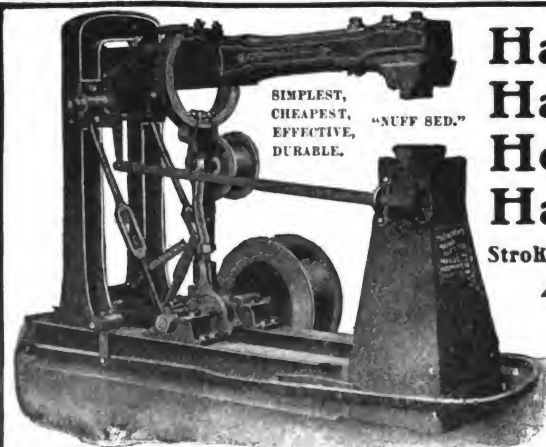


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have been on the market for over  
**TEN YEARS**

and used by good Carriage Builders everywhere. Ask your  
dealer for them. If he can't supply you, write for catalogue  
showing all our different styles.

**National Safety Fifth Wheel Co.,  
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SIMPLEST,  
CHEAPEST,  
EFFECTIVE,  
DURABLE.

"SUFF SED."

## Hathorn's Hard-hitting Helve Hammer.

Stroke adjustable while running.

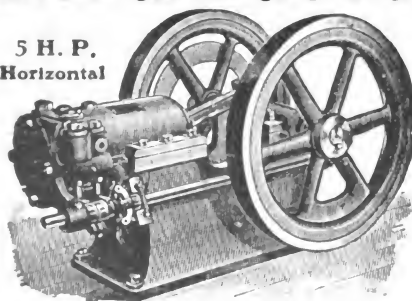
Ask your Dealer or write to

**HATHORN  
FOUNDRY &  
MACHINE CO.**

GRINNELL, IOWA.

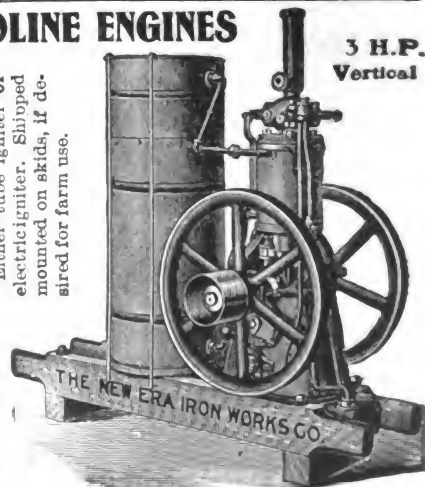
## LITTLE GIANT GAS & GASOLINE ENGINES

5 H. P.  
Horizontal



Sizes, 1 1/2, 3, 4 1/2 H. P. Vertical,  
5 to 25 H. P. Horizontal.  
Either tube igniter or  
electric igniter. Shipped  
mounted on skids, if de-  
sired for farm use.

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Also equipped with pumping attachments. Write  
for booklet describing full line New Era Gas Engines  
from 5 to 100 H. P. Special inducements to dealers  
as agents.

**THE NEW ERA GAS ENGINE CO.**

No. 63 Dale Ave., DAYTON, OHIO.



# Cortland Welding Compound Co.

CORTLAND, N. Y.

Manufacturers of

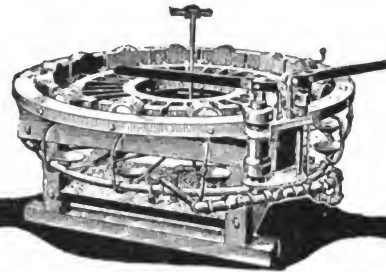
**Climax Welding Compound,  
Cherry Heat Welding Compound,  
and BORAX-ETTE.**



BORAX-ETTE makes steel weld easily. It does not have to be applied between the laps like other compounds, but is used the same as borax. It has no equal for all kinds of steel welding.

**SAMPLES FREE.**

FOR SALE BY DEALERS IN **BLACKSMITHS' SUPPLIES**



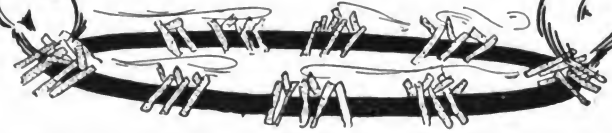
## The New Way

Is better not because it is new, but because it gives more durable work at a far less cost and with a saving of 600 per cent. in time. The new way to set a tire is with the

## West Tire Setter.

This machine consists of powerful hydraulic rams set around a circle and operated by a pump. It is possible to place a pressure of 50 tons on each of the 18 rams of the No. 3 machine if you want it, or as much less as is required (an automatic pressure check stops the pressure at the right moment). Any manufacturer or repair man will find The West the greatest money maker he ever had anything to do with.

THE WEST TIRE SETTER CO., Rochester, N. Y.



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Steel Letters and Figures  
**BURNING BRANDS**  
Stencil Dies, Stencils, Etc.

Geo. M. Ness, Jr.,  
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Price List sent upon application.



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ALLEN-RANDALL CO., Springfield, Mass.

**A COURSE IN  
VETERINARY  
MEDICINE**  
**PRELIMINARY  
LECTURE  
FREE**  
**BEN TROVATO**  
**STATION H  
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### THE WINNER DISC SHARPENER.

It is designed to sharpen all sizes and styles of discs. Besides your disc work you can sharpen axes, shovels, plow points, cold chisels, lathe tools, etc. **CIRCULARS FREE.**

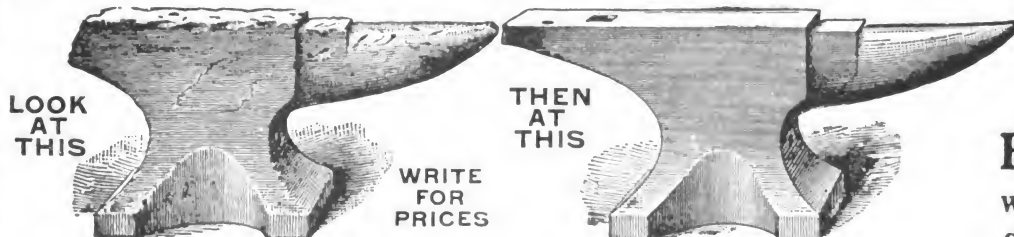
Shipp & Dickerson, Renner, Texas.

**CASH** Always Secures **BARGAINS** and **ALWAYS WILL**  
Special Net Price on Sarven Patent Wheels  
(C. B. goc. extra) with steel and rubber tire

Size of tread	Price per set for wheels with flat steel tire on and hubs bored	Price per set for wheels complete with channel and rubber tire on, and hubs bored.		Add to price of wheels for axles and boxes set
		36 and 40	38 and 40	
3/4	\$6.00	\$13.50	\$14.00	\$1.90 L.D.
1	6.25	14.50	15.00	1.90 "
1 1/8	6.50	16.00	16.75	2.10 "
1 1/4	8.25	24.00	25.00	2.25 H.P.

**PROMPT SHIPMENTS** Repair Wheels, \$3.75.  
Five sets or more, one order, you can deduct 25c. per set as freight allowance. Write for catalogue. We manufacture wheels with Steel or Rubber Tire on. 3/4 to 4 inch tread. Buggy Gears with wheels and shaft all ready for body, \$15.00.  
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**NO MATTER HOW BADLY THEY ARE BROKEN WE CAN REPAIR THEM IN GOOD SHAPE**



## Columbus Anvil and Forging Co.,

West Frankfort St.,  
COLUMBUS, OHIO.

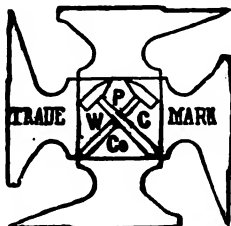
**WE ARE EXPERTS AT REPAIRING OLD WROUGHT ANVILS.**  
WE ALSO MANUFACTURE THE CELEBRATED ARM AND HAMMER BRAND ANVIL.

ASK YOUR DEALER FOR THEM.

**YOU WILL NEVER FAIL**

*To Make a Strong, Clean Weld If You  
Use Perfection Welding Compound.*

We invite you to give our Compound a thorough test, and will ship any amount to any address for that purpose. If it does not prove just as represented we pay all expenses.



Perfection Welding Compound will do the trick quickly and neatly. It makes a stronger weld than any other compound manufactured, as proven by the tests it has undergone. Send for free sample.

PRICE CONSISTENT WITH QUALITY.

**PERFECTION WELDING COMPOUND CO., SCRANTON, PA.**

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**HAND SAWS**  **POWER SAWS**

*BEST & CHEAPEST* **FOR YOU.**  
*FOR YOUR CUSTOMERS.*

**SOLD THE WORLD OVER**  
**KNOWN TO ALL FIRST CLASS DEALERS.**

**DIAMOND SAW & STAMPING WORKS**  
**357 7th ST. BUFFALO, N.Y. U.S.A.**

SOUTH BRITISH TRADING CO. LTD. DIRECT  
REPRESENTATIVES, 6 VICTORIA AVE.,  
DISHOPSTREET, WIMBORNE,  
LONDON, E.C. ENGLAND

Hastings, Mich., May 3rd, 1906.

Buffalo Forge Co.,  
Buffalo, N. Y.

Dear Sir:—

I have two Buffalo Blowers in the shop. They are good ones. I have used one of your Blowers just 20 years. The other seventeen. Have babbitted them both once, both within the last sixty days, and they run as well as they did the first week I used them, 17 and 20 years ago. Should I ever live long enough to want another Blower, it would be very natural to apply to your house.

Very truly,  
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**Steam Cooled  
Double Piston  
No Foundation**

**Send for Catalogue  
Showing Superior  
Points, and get  
Prices**

**KANSAS CITY HAY PRESS CO.** 482 Mill St.  
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## Hercules Hydraulic

**Before  
You  
Buy a  
Tire Setter**



**National Machine Co.**  
KEOKUK, IA.

## THE SCIENTIFIC HYDRAULIC TIRE SETTER



**IS WHAT YOU  
WANT.**

**WRITE TO  
STANDARD TIRE  
SETTER CO.,  
KEOKUK, IOWA.**

## HAY-BUDDEN SOLID WROUGHT ANVILS

**The Gold Medal Anvil  
Highest Award**

OMAHA, 1898 PAN-AMERICAN, 1901

Every Genuine "Hay-Budden" Anvil is made of the best American Wrought Iron and faced with best Crucible Cast Steel. Every genuine "Hay-Budden" Anvil is made by the latest improved methods.

WEIGHTS FROM 10 TO 800 LBS.



**OVER 100,000 IN USE**

**WARRANTED**

Experience has proved their worth and demonstrated that "HAY-BUDDEN" Anvils are Superior in Quality, Form and Finish to any on the Market.

**HAY-BUDDEN MFG. CO., BROOKLYN, N. Y.**











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